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THE INDIAN
AMATEUR GARDENER

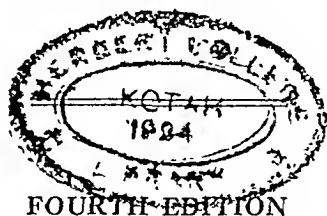


ANNUAL CHRYSANTHEMUM "NEW COMET"

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THE INDIAN
AMATEUR GARDENER

BY
"LANDOLICUS"



Revised and brought up to date

BY
R. LEDLIE
Late Supdt., Government Gardens
FYZABAD, U. P.

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PREFACE TO FOURTH EDITION

THE present book is a revised edition of *The Indian Amateur Gardener*. It is divided into three sections: the Ornamental Garden, the Vegetable Garden and the Fruit Garden, added to which are chapters on Timber Trees, Soils and Manures, Propagation, Garden Design, Flower Beds, Pot Plants, Plant Diseases, Care of Trees, Hedges, etc.

All information has been brought up to date. The portion on the Ornamental Garden has been enlarged and that part dealing with the description of plants has been divided up. The selections given embody some of the more recent introductions which have proved worth growing.

The information on the Vegetable and Fruit Gardens has been enlarged and brought up to date, where considered necessary.

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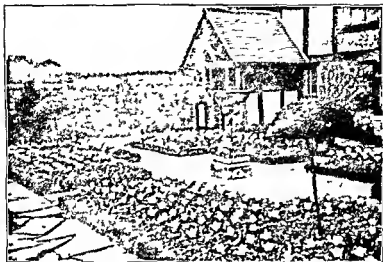
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SINGLE EARLY TULIPS AND MYOSOTIS



SWEET WILLIAMS, GROWING IN THE ROYAL GARDENS, K.L.W.

Chapter One.

CALENDAR.

JANUARY.

IN hill stations, when the weather is clear, all outside plants should have their roots mulched with leaf mould, ashes or manure. All hardy bulbs, such as Anemones, Crocuses, Hyacinths, Ranculus, Snowdrops and Tulips, can be planted now, covering the beds with a mulch. Sowings of Gloxinias and Gesneras can be made. Place Dahlias in hot beds to secure cuttings. Geranium cuttings can be planted. The watering of plants to be done sparingly. Autumn sown seeds of Cinerarias, Petunias and Primulas, etc., should be pricked off into small pots. Water old plants of *Primula sinensis* with weak liquid manure; these and some Geraniums should be in flower in the conservatory.

In the plains prune Allamandas, Hibiscus, Ixoras, Jasminums, Lagerstroemias, Lantanas, Nyctanthes, and Quisqualis. Surface dress Roses. Chrysanthemums taken up, divided and planted in nursery beds. Candytuft, Mignonette, French Marigolds, Nasturtiums and Convolvulus can be sown for the last time. Seedlings of annuals should be planted out: Heliotrope, Geranium and Verbena cuttings.

FEBRUARY.

In hill stations shrubberies need digging over and hoeing of bulb beds. Plants propagated now flower as

well as those propagated in autumn Geranium cuttings can be made and old plants given bottom heat Top dress Auriculas and other pot plants Anemones, Gladiolus, Primrose and Polyanthus can be planted now Small sowings of annuals in bottom heat If the weather is fine, transplant former sowings Plants affected with mildew should be sprayed with sulphur Pot plants, if necessary, to be potted on

In the plains all tuberous, bulbous or fibrous rooted plants that have been lying dormant during the winter should be started into growth Late seedlings of annuals should be planted out Re-pot orchids Sow Poinciana and Tecoma seeds Increase watering as the weather warms

MARCH

In hill stations all annuals can be sown Continue forking of shrubberies and beds, pruning of Roses, and creepers in general Increase Dahlias by cuttings Carnations to be prepared for blooming

In the plains bulbous plants, such as Dahlias, Lilliums, which have done flowering, should be allowed to die down by withholding water Shrubs, which have done flowering, should be cut back Protect pot plants from the hot winds

APRIL

In the hills complete sowings of annuals Propagation of trees and shrubs, such as budding of Roses and cuttings of Erythrina Tuberous rooted Begonias to be planted out

In the plains trenching for new lawns should be commenced Pot on Chrysanthemums Store bulbs Plant Acimines Prune certain climbers that require it

MAY.

In the hills attention to annuals. Bulbous plants require shifting. Hardy annuals, such as Lupins and Mignonettes, can still be sown. Bulbs, such as Anemones, Hyacinths and Ranunculus, should be in flower. Plant Dahlias in pots. Plants, such as Auriculas, require shading. Final shift of Chrysanthemums. Budding of Roses. Watering with liquid manure.

In the plains continue trenching of lawns. Regular watering of plants and hoeing of surface soil.

JUNE.

In the hills budding of Roses can be continued and propagation by cuttings put down in the shade. Propagate Hollyhocks by cuttings of side shoots. Collect annual seeds. Water when weather is dry.

In the plains pot plants require shelter. Propagation by cuttings of various shrubs and foliage plants. Sowing of hot weather annuals.

JULY.

In the hills propagate plants like Roses, Myrtles, Azaleas and Hydrangeas by cuttings. Liquid manure to Roses, Carnations, etc. Few annual seeds can be sown to bloom in September.

In the plains preparation of flower beds and planting out of hot weather annuals. Pot Dahlia bulbs which may have sprouted. Propagation of tropical plants such as Crotons, etc.

AUGUST

In the hills the garden should be in full bloom Sow annuals to be kept through the winter Pot on recently propagated plants Plant bulbs, such as Amaryallis and Narcissus Divide and re-pot Richardia for winter flowering Chrysanthemums require good watering

In the plains preparation of ground for lawns to be continued and grass to be sown towards end of month Propagation of various herbaceous plants by cuttings Layering of climbers Preparation of seed boxes

SEPTEMBER

In the hills plant bulbs, such as Crocus, Narcissus and Tulips Propagation by cuttings of Roses, Heliotrope, Salvias, Geraniums, etc Re-pot Geraniums that have done flowering Use water sparingly as the atmosphere is moist Surface hoe all pot plants

In the plains sow Cinerarias, Salvias, etc, and make early sowings of Phlox, Asters, etc Preparation of seed beds

OCTOBER

Planting of bulbs to be continued Hyacinths in pots to be plunged for forcing Seedlings to be planted out Arrange protection of delicate plants Sowing of annuals for spring flowering Chrysanthemums require liquid manure Dry off Acimnes and Caladiums

In the plains top dress lawns Pot imported bulbs Sowing of all winter annuals Pruning of Roses Re-potting of pot plants and top dressing

NOVEMBER.

In the hills store away bulbs that have done flowering. Protection for the winter of delicate plants. Plant Tulips. Pot off Pansies, etc.

In the plains propagation of Roses by budding and cuttings. Sow Larkspur and Nemophila. Transplanting of annuals.

DECEMBER.

Protect annuals, bulbs and soft wooded plants in beds by mulching. Fork soil in beds and borders. Commence forcing of Dahlias. Plant out Tulips.

In the plains withhold water from bulbs such as Gesneras and Spreklias. Planting out and potting off of seedlings. Cuttings of Heliotrope, Carnations, etc.

THE ORNAMENTAL GARDEN

*Flowers only flourish rightly in the garden of
someone who loves them*

—Ruskin.

Chapter Two.

ORNAMENTAL SHRUBS.

ABELIA.

THESE are very ornamental shrubs. *A. Trifolia* flowers in threes at the ends of the branches, pale yellow, tinged pink; *A. Floribunda* has rosy purple flowers, about two inches long, in axillary clusters; *A. Rupestris* has small pink flowers, sweet scented. They can all be propagated by cuttings.

ABUTILON.

All plants require more or less shade from the sun, and protection from wind and rain. They are best renewed yearly by cuttings placed in sand or propagated by seed. The flowers are bell shaped and pendulous, the petals folding or overlapping each other. Very showy, decorative and free growing and do well in the hills. The seeds may be sown in the plains in October and in the hills in March and April. The soil should be kept moist as the seeds are hard coated. When large enough they should be pricked out and planted in pots in rich soil. *A. Boule de Neige* is a pure white; *Darwin* is orange, veined red; *Golden Bells* is deep, rich yellow; *Mary Muller* is deep rose; *Sultan* has fine deep red flowers and a double flowered variety *Thompsoni Plena*, orange. Distinct from these are the dwarf *Abutilons*, of which *Calyпсо* is white; *L'African*, dark crimson and *Infanta Eulalie*, pink.

ACANTHUS

These are stately plants of the Thistle tribe and do well as lawn specimens in a deep soil and a sunny situation. In the plains seed may be sown in September or October and in the hills in April.

AGALIA

A. Odorata is a small plant bearing fragrant yellow flowers in axillary racemes. They are borne at various times during the hot and rainy season. It is a handsome plant and is propagated by cuttings taken off at a joint and rooted in sand.

AKEBIA

This is a pretty twining shrub known as *A. Quinata* and bearing purplish brown flowers. Leaves sweet scented.

ALLAMANDA

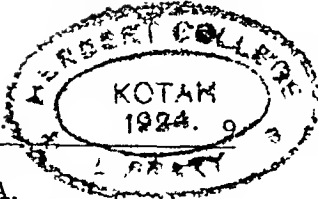
An extensive genus of flowering shrubs of great beauty, easily propagated by layering. Some of the varieties are extremely handsome. Flowers in the hot and rainy season, after which the branches should be well thinned and cut in. In the hills they require the shelter of a conservatory.

APHELANDRA

Handsome shrubs which are propagated without difficulty by cuttings put down in the rains. *A. Cristata* has brilliant orange scarlet flowers, *A. Facinator* has vermilion coloured flowers, *A. Punctata* is bright yellow.

ARDISIA

Large handsome shrubs. *A. Crenulata* with whitish flowers followed by rose coloured berries, *A. Paniculata*, flowers rose and berries red, *A. Umbellata*, pink flowers and purple berries. Propagated by seed and by cuttings in the rains.



ARTHROSTEMMA.

Very handsome shrubs propagated by suckers. *A. Fragile* has rosy flowers; *A. Nitida* has lilac flowers; *A. Lineatum*, white.

AZALEA.

The Chinese and Indian varieties are fine for conservatory decoration. Their treatment corresponds with the Camellia which may be referred to.

BARLERIA.

This will grow in any garden soil and is a very hardy plant. They are many coloured and are a useful ornament in the cold season. Propagated by cuttings. Out of the many varieties *B. Gibsoni* is perhaps the prettiest, bearing large flowers of a light blue colour.

BRUGMANSIA.

These are large shrubs requiring some amount of shade and a rich soil and lots of room for their roots. They are propagated by seeds or cuttings. In the hills they do very well but require protection from frost. They bear splendid flowers of trumpet shape in great profusion.

BRUNSFELSIA.

These are elegant flowering shrubs and are easily cultivated. *B. Acuminata* bears bluish violet flowers in terminal heads; *B. Americana* has whitish or primrose flowers and is sweet scented.

BUDDLEA.

These are pretty and highly useful shrubs easily propagated by cuttings. *B. Madagascarensis* has silvery leaves and handsome orange flowers and looks well as a specimen; *B. Asiatica* has white flowers; *B. Lindleyana* bears pink flowers.

CALLIANDRA

Beautiful shrubs with globular flowers. They do best in a rich soil and are propagated by cuttings put down in sand. Most of the flowers are scarlet in colour and resemble powder puffs.

CALLISTEMON

The flowers of the Bottle Brush have a profusion of stamens, of which they are chiefly composed. The flowers of *C. Lanceolatum* are of a beautiful scarlet colour, the tree looking exceedingly pretty when in full bloom. *C. Salignus* is not so attractive, having pale lemon coloured flowers.

CAMELLIA

These are beautiful shrubs and are usually imported into the country. They do well in hill stations but do not appear to thrive on the plains, where they should be grown entirely in a cool conservatory. They should be kept in a temperature of about 60° F till their growth is made and their buds formed, and during this time should be frequently syringed, and kept clean in a humid atmosphere. They grow well in a clayey loam, mixed with some sand and leaf mould. Towards the end of April they should be moved to a cool situation and then placed out of doors in a sheltered position. They require daily watering and the use of liquid manure. In the hills, by October, they should be placed under glass or in the verandah and their blossoms should open in November or December. When they have done flowering they should be placed in larger pots.

CATESBAEA

This is the Lily thorn. *C. Spinosa* is a pretty plant when in bloom. Its flowers, which are pale yellowish green, hang suspended from it. They are trumpet shaped and are three to four inches long. Propagated by cuttings during the rains.

CESTRUM.

These are very ornamental and are semi-climbers. They are propagated by cuttings and require a rich soil and lots of room for their roots. *C. Nocturnum*, the Lady of the Night, is a night bloomer, with panicles of pale yellowish flowers most delightfully perfumed. *C. Elegans* has red flowers followed by crimson berries. *C. Alba* has white flowers.

CHIMONANTHUS.

C. Fragrans is unornamental but worth a place in the garden on account of the deliciously fragrant yellow flowers. It is propagated by layers.

CITHAROXYLON.

The varieties are principally white flowered and will grow in almost any soil. Propagated by cuttings in the rains. The best is *C. Subserratum* which bears white, sweet-scented flowers.

CLERODENDRON.

These are handsome shrubs commonly known as the Glory tree or Turks Turban. They all do well in the open in moderately good soil and are propagated by cuttings. As they flower on the tops of the current year's shoots, all previous year's growth should be cut away, when pruning. *C. Serratum* var. *C. Wallichii* is a blue flowering variety and flowers during the rainy season. *C. Fallax*, scarlet flowering, also flowers during the rainy season. *C. Kaempferi* and *C. Pamculatum* have scarlet flowers during the hot season. *C. Nutans* is a white variety flowering in the cold season, and the other whites which flower during most of the year are *Fragrans*, *Macrosiphon*, and *Volkameria*.

COFFEA.

The Coffee plant but very ornamental in the garden. In February the bushes are covered with white flowers.

which are extremely pretty against the dark green polished foliage. Seeds should be sown during the rainy season. The berries should not be injured in any way before sowing, and should be put down complete with the foot stalk attached. They can also be propagated by cuttings.

CRATAGUS

The seeds of the Hawthorn should be procured from England and sown as soon as received. It is only suitable for the hills. The double white and the double pink are handsome varieties. The seeds take a very long time to germinate and their irregular sprouting may be spread over a year or more.

CYDONIA

These shrubs require little cultivation and are suited to the hills. They are propagated by layers and cuttings. *C Japonica* has deep scarlet flowers, borne profusely during the greater part of the year. The ordinary quince, *C Vulgaris*, has pale red or white flowers. *C Chinense* is a small tree with rose coloured flowers.

DATURA

Although *D. Alba* is a common weed, there are other ornamental varieties. *D Humilis flore pleno* has handsome double golden yellow flowers which are sweet scented and *D Wrightii* has sweet scented large white flowers edged with lilac. Any soil suits them and they are best planted in beds or borders. They are propagated by seed and may be treated as hardy annuals.

DEUTZIA

These are pretty shrubs growing to about three feet in height. Propagated by division from suckers. *D Gracilis* bears small pure white flowers which are borne all along the stems in terminal racemes in great profusion, in early spring. It also makes a lovely little pot plant.

DOMBEYA.

These are large shrubs and are rather pretty when in flower. Propagated by cuttings. The flowers are mostly sweet scented. Blooms in the cold season. *D. Palmata*, *Gagiana*, *Cuspidata* and *Tiliæfolia* are pink flowered and *Mastersii* and *Alba Magnifica* are white flowered varieties.

DURANTA.

The Sky flower or Golden Dewdrop is a large ornamental shrub bearing flowers at all seasons. They grow in any soil and are exceedingly hardy and make excellent hedges. The flowers are succeeded by bunches of yellow berries. Propagated by seed or cuttings during the rains. *D. Plumeri* bears pretty blue flowers and *Ellsii* bears white flowers.

ERANTHEMUM.

Dwarf handsome foliage shrubs bearing flowers of various colours. There are varieties with variegated foliage splashed with white, red or yellow. They are propagated by layers and grow in any rich garden soil. The flowers are usually blue, white or pink and shades.

ERYTHROXYLON.

A pretty little shrub, with its bright cherry-like berries, which it yields in abundance. It makes an effective border plant. The leaves are medicinal and are used for making Cocaine.

ESCALLONIA.

A choice plant bearing bright pink fragrant flowers, suitable for hill stations. It is propagated by layerings and cuttings.

EXCOECARIA.

Bearing insignificant leaves, it is a handsome plant on account of its foliage, which is deep purplish red on the

under surface Propagated by cuttings during the rains
E Bicolor is most usually seen

FLEMINGIA

Very pretty shrubs when in full blossom They grow in any ordinary garden soil enriched with cow-dung and leaf mould Propagated from seed

FRANCISCEA

Very beautiful small shrub called the Vegetable Mercury *F Hopeana* has violet blue flowers fading to white In flower throughout the year

GARDENIA

Large shrubs with very fragrant flowers requiring a rich soil enriched with old cow-dung or stable manure They are propagated by cuttings, and flower during the hot weather *G Lucida, Florida, Radicans* and *Latifolia* are some of the best varieties, all bearing sweetly scented flowers and having beautiful glossy green foliage

GINORIA

The species *Americana* is a shrub with myrtle-like foliage and purple flowers, which are borne in the hot weather and rains, succeeded by purple berries in the cold season It is propagated by seeds and cuttings put down during the rains

GMELINA

These are large shrubs which are not very attractive and bear yellow flowers during the hot season It is propagated from cuttings of the firm wood

GOLDFUSSIA

These are small shrubs growing in any good garden soil and bearing flowers in the cold season They will

grow in a conservatory or under the shade of trees. They are easily propagated by seed or by cuttings put down in the cold season. *G. Anisophylla* bears pale blue bell-shaped flowers and *G. Colorata* is a crimson flowered variety.

GOMPHOCARPUS.

A rather graceful shrub bearing umbels of flowers followed by a bladder-like thorny fruit. It is propagated by seed and by cuttings put down during the rains.

GOSSYPIUM.

There are only two or three varieties of the Cotton plant which have large showy flowers. They thrive in any soil that has been manured and are propagated by seed sown in the plains in October. They are not of much merit as garden plants but are useful as a background and to hide unsightly walls.

GRAPTOPHYLLUM.

These plants have variegated foliage and do well in conservatories. *G. Hortense* has foliage marked with white and *G. Rubro pictum* has foliage marked with bronzy red.

GRISLEA.

G. Tomentosa, known before as *Woodfordia floribunda*, is an object of great beauty during the cold season, when its branches are covered with small scarlet flowers, making a blaze of colour. The foliage turns red in the autumn. It is propagated by cuttings.

HABROTHAMNUS.

These are rather an extensive genus of most handsome shrubs, which are very choice and attractive. The flowers are borne in great profusion in pretty bunches of brilliant colours and of a waxy appearance. In the hills they require some protection during the winter months, but

in the plains they grow vigorously, though old plants often die off during the rains. Propagated from cuttings put down in October. They require good drainage. *H. Elegans* has beautiful carmine flowers, *Fascicularis* is bright crimson, *Aurantiacus* is orange yellow and *Zephyrinus* is shaded red.

HAMELIA

The Rat Poison tree, *H. Patens*, bears orange pipe-like flowers in sprays, succeeded by red berries. It should be pruned during the cold season as it loses its leaves. Propagated by cuttings.

HAMILTONIA

Shrubs bearing sweet-scented flowers during the cold season. They soon grow unsightly if not annually pruned to keep them in form. They are propagated by cuttings of half ripe wood put down in October. *H. Suaveolens* has pale heliotrope coloured flowers, and there is also a white variety, *Alba*.

HIBISCUS

The Shoe Flower is a well known dwarf flowering shrub, grown as specimens or hedge plants. It is easily propagated from cuttings or layerings. There are numerous varieties, some of which are hardly to be distinguished from one another. They should be cut in after flowering. The colours range from white, yellow, orange, pink and red to lilac. *H. Mutabilis* has white flowers changing to pink.

HOLMSKIOLDIA

A rather pretty, spreading pubescent shrub, bearing red tubular flowers in great profusion just before the cold weather sets in. *H. Coccinea* should be well cut in after flowering. Propagated by seeds or cuttings.

HUMEA.

H. Elegans is a very handsome plant. Grown in the border it is very ornamental. It has a drooping habit and the leaves, when rubbed, yield a powerful odour. The flowers are red, borne on spikes, and have a most delicious and strong scent. Propagated from seed.

ILEX.

The Holly will not succeed in the plains, but grows well in hill stations, where it may be propagated from cuttings. The *I. Paraguarensis* is the Mate of Paragua tea. *I. Aquifolia* is the English holly and *I. Dipyrena* is a native of India. *I. Argentia* is a lovely variety, with a large blotch of white in the centre of the leaves.

INGA.

Rapidly growing plants which must be well pruned to keep them in bounds. If allowed to grow they develop into large trees. *I. Saman* is the Rain tree. *I. Dulcis* is the Madras Thorn, and is extensively used as a hedge. Propagated by seed sown in the rains.

IXORA.

Handsome dwarf flowering plants useful in the border or as a hedge. All of them thrive well in India and will grow in any garden soil. Propagated by layering and cuttings, while a few varieties yield seed. *I. Coccinea*, the common variety, has bright scarlet flowers. They are available in numerous colours ranging from white and yellow to terra-cotta and orange. They are in flower during the rainy season mostly.

JACARANDA.

These are handsome flowering plants, with fine feathery fern-like foliage. Propagated by seed. Flowers in April and May. *J. Mimosæfolia* has large panicles of pretty blue bell-shaped flowers.

JASMINUM

The Jasmine includes a numerous species, but only a few are deserving a place in the garden. They are best pruned in after flowering, especially the straggling kinds. They are easily propagated from cuttings taken during the rainy season. They grow well in any garden soil enriched with manure. *J. Grandiflorum* is the Chameli, a semi-scandent shrub with fragrant white flowers, *J. Pubescens* is the Kund, a dwarf compact plant with abundant white flowers, and *J. Sambac* is the Mogra, a low spreading shrub with highly fragrant double white flowers.

JATROPHA

This is the Coral plant, bearing in its numerous varieties mostly red flowers with ornamental foliage. Propagated by seed or by cuttings. *J. Multifida*, *Panduræfolia* and *Podagrica* are varieties in cultivation.

JUNIPERUS

These are all slow growing but very ornamental plants. They are propagated by cuttings and layerings, and grow in any soil without much care. *J. Chinensis*, *Aurea*, *Variegata* and *Communis* are varieties.

JUSTICIA

Dwarf ornamental shrubs, often used as a dwarf hedge or edging. They are propagated by cuttings and will grow in any garden soil. *J. Coccinea* has scarlet flowers, other useful varieties are *Gendarussa*, *Argentea* and *Grandiflora*.

LAGERSTROEMIA

The Crepe Myrtle is a very handsome plant when in flower during the rainy season. As a hedge it is an object of great beauty with its large bunches of flowers in various colours, white, red, pink and lilac shades. They grow

well in any soil and are easily propagated by cuttings put down in the rains. *L. Flos Reginæ* is the Jarul tree of India and bears pretty mauve coloured flowers.

LANTANA.

Most of them bear pretty flowers, orange, red, yellow, white or lilac. They flower all the year round and are propagated by cuttings and seed. The leaves have a powerful sage-like scent.

LAVANDULA.

The Lavender, *L. Spica*, is a pretty plant, easily raised from seed and kept from year to year. The plants thrive in a light soil richly manured with leaf mould only, and well watered especially during the flowering season, and in the hot weather. It is better for being given a little shade during the summer and must be protected from the rains, when this is excessive.

LAWSONIA.

The Henna, or Mendhi, *L. Alba* makes a very good hedge growing to a height of from ten to twelve feet. When in bloom, with its panicles of greenish white flowers, it scents the whole garden with its fragrance, which is powerful and agreeable. It is easily propagated by cuttings put down during the rains; it may also be grown from seed which it bears abundantly. There is a reddish flowered variety, *Rubra*.

LEEAE.

L. Sanguinea is a tall shrub flowering in the rains with large dense heads of scarlet flowers.

LEMONIA.

L. Spectabilis is a pretty shrub which bears bright crimson flowers and remains in bloom a long time. Its

leaves, when crushed, have a delicious fragrance. It should be well watered and sheltered from the sun. It produces seed in abundance during the cold season, from which it is propagated. There is a variety with pale pink flowers, *Rosea*.

LYTHRUM

Plants of easy culture bearing handsome flowers in dense long spikes at the summit of the stems which grow to a height of about three feet. The seed may be sown in October, and again in February and March, in open beds or in pots, and transplanted to beds when strong enough to handle. *L. Alatum* has purple flowers and *L. Graefferi* bright pink.

MAGNOLIA

M. Grandiflora is a handsome small tree of about 15 feet in height, with pretty, glossy, laurel-like leaves, and bears splendid large, sweet-scented flowers. They are plants of great beauty and require a rich soil and should be planted in a somewhat shaded position, at least shaded from the fierce rays of the midday sun during the summer. They grow with difficulty in Bengal but succeed in Upper India. Propagated by gootee grafting. *M. Fuscata* bears highly fragrant flowers of a yellow or cream colour. *M. Pterocarpa* grows into a tree and has large white, fragrant flowers. *M. Pumila* is a dwarf variety with highly fragrant flowers.

MALPIGHIA

The Barbados Cherry is a handsome shrub which is often used for hedging purposes. The variety *Coccigera* bears whitish pink flowers which are followed by a crop of small berries, much like cherries, the size of a pea. *M. Glabra* has purple flowers with yellow anthers in the centre. Propagated by cuttings.

MARTYNIA.

These plants bear rather handsome flowers, like that of a Foxglove in shape, of rather an agreeable scent. They require to be protected from frost. The seed pods are hard and black, with two sharp thorns at the narrow end. *M. Diandra* has rose coloured flowers; *Fragrans* is much the same, though of smaller growth; and *Lutea* has yellow flowers. Propagated from seed.

MEMOCYLON.

M. Edule is a pretty shrub when in flower bearing purplish blue fragrant flowers. It is considered a jungle plant of this country.

MEYENIA.

M. Erecta is a pretty shrub, with pretty gloxina-like flowers, bluish purple with a pale yellow tube. Propagated by cuttings and seed. It grows in any garden soil if well manured and watered during the hotter months of the year. In flower during the cold season. *M. Hawtayeana* is more of a climber with azure blue flowers with a white tube. It is nearly always in flower and is propagated by seed.

MICHELIA.

These plants are valued for the delicious fragrance of their flowers. *M. Champaca*, or the Chumpa of the natives, bears yellowish flowers of a dull colour but are exceedingly fragrant. *M. Alba* has white flowers.

MONTANOA.

M. Bipinnatifida is a tall pretty shrub with large bunches of white flowers borne in December. It is propagated by cuttings.

MUNRONIA.

M. Javanicum is propagated by cuttings put down in the rains and has fragrant white flowers produced during the rainy season.

MURRAYA

The Chinese Box is a handsome shrub bearing sweet-scented flowers and very useful as an ornamental hedge. *M. Exotica* bears corymbs of white sweetly perfumed flowers followed by red berries. It is propagated by cuttings.

MUSSAENDA

These are peculiar in producing leafy sepals of a white or scarlet colour around the flowers, which in comparison are somewhat inconspicuous. They are propagated by cuttings put down in the rains. *M. Frondosa* has yellow flowers with white sepals, *M. Erythrophylla* has yellow flowers with scarlet sepals, *M. Corimbosa* has pale orange flowers with white sepals. They are at their best during the rains.

MYRTUS

The Myrtle is a well-known shrub bearing sweetly scented white flowers and leaves during the hot weather. Propagated by layers. There is a pink flowered variety, *Tomentosa*.

NERIUM

The Oleander are common shrubs which bear flowers at the end of their shoots, which grow to a length of seven or eight feet. The leaves are also chiefly confined to the summit of these shoots, and so to avoid the lower portions of the plant from becoming bare, the plants should be pruned in after flowering. They grow readily from cuttings and layers. The flowers are sweet scented. They can be obtained with flowers in a variety of colours in white, pink and red in numerous shades. They are all very pretty when in full flower, especially the double varieties, which are loaded till drooping with clusters of flowers.

OCHNA.

O. Squarrosa is a tall shrub bearing yellow scented flowers during the hot weather. Propagated by cuttings put down in the rains and also by seed.

OLEA.

These are very choice shrubs, especially *O. Fragens*, which is propagated with much difficulty by cuttings in sand under glass. It grows to about five feet in height and bears bunches of white flowers which are very fragrant. They are not suited to the plains where they will grow with some difficulty.

OXYANTHUS.

These are highly ornamental shrubs, bearing white or yellow flowers, scented, elongated and in racemes. They are quite as hardy in India as Gardenias. *O. Hirsutus* bears fragrant, white, star-shaped flowers. *O. Versicolor* has whitish, rose coloured and pink flowers and is a smaller plant than the other.

PAEONIA.

The *Pæonia* will only succeed in hill stations. The flowers vary in colour from pure white to bluish salmon, and from rose to the most intense scarlet. The Chinese varieties are hardy and early flowering. Grown upon a lawn, or in a conspicuous part of the garden, they are very handsome ornaments, when given a rich soil and careful treatment. They are exquisitely pretty plants, their colouring is extremely rich and they are most profuse bloomers.

PANDANUS.

The leaves of the Screw pine grow in whorls or are screw-like in arrangement, and are long, strap formed with spines along the edges. *P. Odoratissimus* has powerfully fragrant flowers enclosed in whitish sheath-like leaves and

sends down aerial roots from the stem. There are other varieties, but this is the most commonly met with. There is a variegated type of *P. Odoratissimus variegatus* whose leaves are edged with white.

PARKINSONIA

The Jerusalem Thorn bears small, sweetly scented yellow flowers in pendulous racemes and should be grown in well drained porous soil. Is a useful hedge plant on account of its thorny nature. It is propagated by cuttings and seed.

PAVETTA

These shrubs are very much like *Ixoras* and are propagated by cuttings put down in the rains. The flowers of most of the varieties are white and generally fragrant.

PEDILANTHUS

The Adjutant's hedge or Jew plant is often used to form a hedge and bears small purplish crimson flowers. It is propagated by cuttings.

PENTAS

P. Carnea is a pretty herbaceous shrub, bearing *Ixora*-like heads of flowers of a pale lavender pink colour nearly all the year round. They do well in a rich soil and with partial shade. Propagated by cuttings. The varieties *Kermesina* with crimson flowers and *Paraisflors* with flame coloured flowers are not widely known.

PHILADELPHUS

The Syringe or Mock Orange can only be cultivated in the hills. Its flowers are white with a strong orange scent and the leaves have the odour and taste of cucumber. They should be well cut in after flowering, as the flowers

are borne on the last year's wood. Propagated by cuttings or layers. *Coranarus*, *Hirstus* and *Grandiflorus* are varieties.

PHLOGOCANTHUS.

P. Thyrsiflorus makes a pretty plant in the border with its spikes of purplish red flowers. It is propagated by cuttings which are best taken in the rains. It requires a well-drained porous soil.

PITTOSPORUM.

P. Tobira is an exceedingly handsome shrub about four feet in height. Its chief beauty lies in its foliage, which is of a shining green. It seldom flowers in this country, but when it does it bears white fragrant flowers in terminal clusters. *P. Tobira variegatum* has variegated leaves.

PLUMBAGO.

P. Capensis requires to be grown in a somewhat shaded position and bears, almost at all seasons, but especially during the hot and rainy seasons, pale azure blue flowers, in form and arrangement like Phlox blooms. It is benefited by pruning during the cold season. Propagated by cuttings or division. *P. Rosea* has rose-coloured flowers and *Zeylanica* has white flowers.

PLUMERIA.

The Frangipani bears beautiful corymbs of light fragrant flowers during the hot season and rains and is obtainable in a variety of colours and hybrid forms. *P. Acuminata* bears white flowers with a yellow throat and of a waxy appearance. There are varieties with red, white and yellow colours and combinations of these. Easily propagated by cuttings.

POINCIANA.

P. Pulcherrima can be had in two varieties, one with red and the other with yellow flowers. These are borne

in immense erect tuft-like racemes and are a pretty sight in the garden. They are of straggly growth and should be cut in during the cold season. They do not like a very cold climate and are easily propagated from cuttings.

POLYANTHUS

Seed should be procured from Europe for sowing in November and December in the plains and in November in the hills. They should be sown in pans or boxes, well drained and filled with a light but rich mould. The seed must be very lightly covered with soil and very sparingly watered. No artificial heat is required. When the seed germinate they must be shaded from the sun and rain. When the plants are strong enough, they should be picked out and planted in a shady situation in beds. The compost should consist chiefly of loam, sand and leaf mould in equal parts, and a small quantity of old cow-dung should be added. The plants will begin to grow in spring and will require to be slightly earthed up, when they will flower beautifully. They may be divided in the Autumn and put into pots. When the plants show signs of bloom the pots should be surface dressed with a richer compost without disturbing the roots. Frequent watering with liquid manure is very beneficial when the plants are in bud or bloom. As the flowers fade on pot plants, the plants should be taken up, divided, and planted out in beds in a shady situation. They may be re-potted again the following Autumn. The spikes of bloom should be staked.

PORTLANDIA

The White Horse of Jamaica, *P. Grandiflora*, is an exceedingly choice shrub of exquisite beauty. The foliage is very handsome, of a rich glossy green, which contrasts well with the flowers, which are about five inches long and pure white, like those of the White Lily, and exquisitely fragrant, especially at night. *P. Coccinea*, scarlet with yellow anthers. They grow in any good garden soil, but

require protection from the cold, even in the plains. A conservatory would suit them well. Propagated by cuttings in the rains.

PUNICA.

The Pomegranate makes a handsome plant when in flower with its lovely scarlet blossoms. When pruning only weakly branches should be thinned out, and not cut down indiscriminately, as the flowers are borne on the extremities of the branches formed of the current year's growth. There is a double flowered variety. In flower during the hot weather.

QUASSIA.

Q. Amara is a handsome flowering plant bearing beautiful flowers of a rich scarlet, like *Salvia Splendens*. Propagated by cuttings placed under a hand glass in sand.

RHAPHIOLEPSIS.

The Indian Hawthorn is a pretty shrub which is quite hardy and will grow well in the hills. *R. Indica* flowers in February with pretty white or pink tinted blooms the size of the English Hawthorn in terminal panicles. There are varieties of this species: *var. Phæostemon* has white flowers with brown filaments; *var. Rubra* has reddish flowers. *R. Japonica Integerrima* has pure white fragrant flowers in terminal panicles.

RHODODENDRON.

This is the most magnificent of flowering shrubs and grow wild in the Himalayan range. They are particularly hill plants where the half hardy varieties succeed well. There are hundreds of cultivated species, but the following are some of the best: *Maculatum Grandiflorum*; *Roseum Piculuratum*; *Blandyanuru*; *Atrosanguineum*; *Nobleanum*; *Duchess of Sutherland*; *Paryllianum*; and *Towardiana*. They bear frequent removal, but care must always be taken not to break the ball of earth round them or loosen

the soil from the stem. They will grow in any light vegetable soil of a sandy character enriched with old manure. The dwarf varieties are suitable for rockwork edging to clumps of the strong growing varieties.

RONDELETIA

R. Brilliantissima is a pretty plant with its heads of orange scarlet blossoms borne nearly all the year round. *R. Odorata* has fragrant vermilion flowers and *R. Purdiei* has pale yellow, fragrant flowers. They are all propagated by cuttings which take some time to root, or by seed.

RUSSELIA

Weeping Mary, or *R. Juncea*, is an extremely handsome plant, flowering most of the year, with bright scarlet tube-like flowers which are borne in drooping profusion on long rush-like stems with feathery foliage. A pretty way of growing it is in suspended baskets. *R. Floribunda* is an erect growing variety bearing flowers very like the last, but of a crimson scarlet colour. Both varieties are propagated by division most readily, and the plants being extremely hardy, grow in any ordinary garden soil.

SALIX

The Weeping Willow, *S. Babylonica*, is the only species generally met with in India and makes a pretty object growing by the side of water. There are other species but not of sufficient merit for the garden. The Weeping Willow lives but a short life in the hills, owing to a borer which penetrates the timber and soon kills it. It is propagated by cuttings.

SERISSA

S. Fœtida is a pretty little shrub, about two feet in height, bearing small double white flowers at almost all seasons. Propagated by cuttings.

SKIMMIA.

These are pretty Laurel-like shrubs with whitish flowers, clustering in terminal panicles which are branched, followed by bunches of berries. They all thrive in the hills, and in the plains only succeed in grass conservatories. They are propagated by seeds and cuttings. *S. Fragrans* has sweet scented white flowers. *S. Japonica* has Holly-like white flowers in panicles; there is a variegated variety of this with the leaves bordered with white. *S. Laureola* is a pretty citron scented plant with pale yellow, very fragrant flowers in compact corymbs. *S. Oblata* is a pretty species from Japan with bright vermilion berries.

SOLIDAGO.

S. Canadænsis is the Golden Rod, a dwarf shrub with crowded panicles of flowers of a yellow colour. It is propagated by division.

SOPHORA.

This is an exceedingly pretty shrub but growing with great difficulty in the warmer parts of India. *S. Tomentose* is a rather large shrub with showy Laburnum-like flowers of a pale violet colour. *S. Tetraptera* is a species with yellow flowers. The Japanese Pagoda tree, *S. Japonica pendula*, is exceedingly pretty, willow-like, drooping, with small whitish flowers in loosely branching panicles. All propagated from seed.

SPARTEUM.

The Spanish Broom, *S. Junceum*, bears yellow fragrant flowers, which are showy and borne in terminal racemes. Broom-like, it seldom has leaves. It is a very ornamental plant and with care outlives the hot season in the plains. It grows more easily in the hills, but when young requires to be sheltered from the heavy rains. It is propagated from cuttings. The twigs, when macerated, yield a good fibre.

SPIRAEA

Roots of the Meadow Sweet are imported and put down in the hills in spring and early in September in the plains, when they soon show signs of growth. A soil rich in leaf mould suits them. They have flowers in dense heads, the flowers individually small, but in great profusion. *S. Japonica* is elegant and as a pot plant has few rivals. Its feathery blooms are purest white. It delights in a rich soil and is well adapted for rockeries, and also for the border in a partially sheltered situation, especially in the plains. *S. Palmata* is a lovely plant with bright crimson flowers.

STACHYTARPHETA

The Brazilian Tea tree, *S. Jamaicensis*, is a dwarf shrub, pretty when in flower with its spikes of blue flowers. It is propagated by cuttings. *S. Mutabilis* is a coarse looking plant bearing rose crimson flowers. *S. Orubica* has violet coloured flowers.

STROBILANTHES

S. Dyerianus has handsome purple tinted leaves and makes a pretty pot plant, or looks well in a rockery. *S. Glomeratus* has the undersurface of the leaves coloured purple and *S. Scaber* has yellow flowers. They all can be grown in a conservatory and are easily propagated by cuttings put down in light soil in the rainy season. They thrive best in a light rich soil.

TABERNAEMONTANA

The Chandni are handsome shrubs and are easily propagated by cuttings put down in the rains. *T. Coronaria* has pretty single flowers, of a wax-like appearance. There is a double variety, as also one with variegated foliage. *T. Dichotoma* has single flowers scattered all over the

plant. *T. Recurva* has fragrant flowers in great profusion during the hot season. The plants are sometimes used as a hedge.

TAMARIX.

The common Jhau, *T. Articulata*, is a tall shrub bearing pale reddish purple flowers and having feathery casurina-like foliage. Another variety, *T. Dioica*, has whitish pink flowers. Propagated by cuttings put down in the rains.

TAXUS.

The Yew grows well in the hills and is used as a hedge plant. There appears to be only one variety, *T. Chinensis*, mentioned in any works on Indian Gardening, but there are other fine species which would probably all do well in the hills.

TECOMA.

These are tall shrub flowering most of the year round and useful not only in the shrubbery but also as a hedge plant. The flowers are produced in terminal bunches and are trumpet shaped. *T. Capensis* has orange scarlet flowers and *T. Chrysantha* and *T. Stans* both have yellow flowers. Generally propagated by seed and also by cuttings.

TEPHROSIA.

T. Candida is a beautiful shrub, splendid when in bloom with its large white blossoms. The plant has an elegant appearance with its ashy greyish green foliage underneath the leaves and brilliant green above them. Propagated from seed which may be sown at any season of the year.

THEVETIA.

T. Nerifolia has leaves much like the Oleander and tubular flowers of a yellowish orangy colour, followed by almond-shaped nuts. Propagated by seed.

THUJA

The *Arbor Vitæ* is a most ornamental shrub and makes one of the finest ornamental hedges. All the varieties are propagated by seed. *T. Orientalis* is a large growing species and *T. Compacta* is a dwarf kind.

VINCA

These are pretty flowering plants of a dwarf habit which thrive in any kind of soil without any care. If left to themselves they send shoots along the ground and increase rapidly. *V. Alba* has white, *V. Rosea* rose and *V. Major* blue coloured flowers. They can be increased by cuttings.

Chapter Three.

BEAUTIFUL CLIMBING PLANTS.

AESCHYNANTHUS.

THESE are lovely twining plants and are worthy of extensive cultivation. They are easily grown on a block of wood which must be covered with moss, on to which they should be tied with copper wire; the roots should first be tied with moss before tying them on to the block, after which they require syringing with water as necessary and occasionally dipping in tepid water. They may be grown in pots in light rich compost and trained up a trellis. Cuttings about three inches long of half ripened wood should be made and placed under a bell glass in moderate bottom heat, after removing all the leaves except one or two at the top. They root readily in February or March. When they have rooted, transfer singly to small pots, covering with a bell glass in bottom heat till established. Baskets are commonly employed for them and is an effective way of growing them. They should be lined with moss and filled with rich light compost, and the branches fastened down with pegs. Water well in summer to induce growth and in the cold weather they should be allowed to rest. Plants grown from cuttings flower the second year. *A. Fulgens* bears deep bright crimson flowers with a very long throat and tube on the under side orange; the lobes are striped black. It flowers in October. *A. Grandiflorus* is large flowered, deep crimson orange, the segments with a dark mark on top; flowers

in August *A. Atrosanguinea* is dark red and flowers in July *A. Cordifolius* red flowers striped with black, *A. Longiflorus* scarlet flowers during the summer, *A. Tricolor* deep blood red, lobes striped black, throat and base of lobes bright orange

ANTIGONON

The Sandwich Island creeper Beautiful fast growing climbers which tend to become bare at the bottom To avoid this they should be pruned down annually at the commencement of the rains and new growth will soon spring up *A. Insigne* has rose-coloured flowers which are double in appearance, *A. Leptopus* is a deep pink and *A. Leptopus alba* has white flowers Propagated by layering and by seed It is better to propagate the white variety by means of layers as seed do not come true to type

ARGYREIA.

These are shrubby climbers flowering the greater portion of the year and propagated by cuttings *A. Argentia* is very large with silvery, velvety heart-shaped leaves, especially on the lower surface, which is almost like down It bears whitish rose flowers in the rains, *A. Splendens* has tubularly bell-shaped flowers of a pale red colour, and *A. Campanulata* has pinky purple flowers

ARISTOLACHIA

These are light climbers bearing flowers most curious in form The Dutchman's Pipe There are a number of varieties to be found in India, out of which *A. Elegans* is the most common The flowers are a very dark purplish velvety colour mottled on cream or white ground *A. Gigas* is a gigantic variety and most curious The plants are readily grown in a grass conservatory in a light soil enriched with leaf mould Some of them grow readily in the open in the plains, but in the hills they will not succeed

unless in a warm conservatory. The flowers are brown and cream and are *fœtid* smelling. The variety *Elegans* is grown from seed, but the others are grown from cuttings.

ARTABOTRYS.

The Tail Grape, *A. Odoratissimus*, is a shrubby climber with extremely fragrant greenish yellow flowers, borne chiefly in the rains. Propagated by seed or cuttings in the rains.

BANISTERIA.

These are very ornamental and extensive creepers and require the support of strong iron posts. They are propagated by layering. *B. Laurifolia* is a well-known variety with its olive green foliage, roughish and hard to the touch, and covered over with its bright yellow or golden flowers in large clusters. *B. Chrysophylla* bears deep orange-coloured flowers. *B. Ferruginea* is yellow flowered and so is *B. Fulgens*.

BEAUMONTIA.

B. Grandiflora is a very extensive and rampant creeper, bearing in the cold season a profusion of flowers of a trumpet form, white tinged with green, which are very pretty and slightly scented. Is best grown on a wall and is propagated by layering.

BIGNONIA.

Some of the Bignonias are very handsome and grow well in any garden soil enriched with manure. They are propagated by layers or cuttings put down under glass. *B. Venusta*, the most beautiful of all Bignonias, in the cold season is literally one mass of gorgeous colour. The flowers are orange and tubular shaped and borne in huge trusses. *B. Chamberlayeni* flowers during the hot months,

but is, on the whole, a shy bloomer, it bears creamy yellow flowers. *B. Crucigera* is coppery yellow, *B. Incarnata* is pale lilac, striped purple, *B. Magnifica* is purple, and *B. Tweediana* is yellow.

BOUGAINVILLEA

These are magnificent climbers thriving in any garden soil without much care. Propagated by layers. *B. Spectabilis* has small pale yellow tubular flowers between two pale crimson bracts and is one mass of bloom in the spring. *B. Glabra* is thornless and in bloom nearly all the year round with magenta coloured flowers. *B. Splendens* bears magenta flowers during the cold season and is a very fine object when in bloom. *B. Lateritea* is a brick-coloured variety, flowering during the cold season, and is a great object of beauty. *B. Scarlet Queen* is a recent introduction and bears crimson scarlet flowers during the cold season.

BOUSSINGAULTIA

The Madeira Vine, *B. Baselloides*, is a very pretty and elegant creeper, doing well both in the hills and the plains. The flowers are white and fragrant, small and disposed in clusters. They are quick growing plants and are propagated from tubercles produced on the stems.

CAMOENSIA

C. Maxima is a magnificent and gorgeous climber flourishing in a rich loam mixed with leaf mould. Propagated by cuttings which root in a sandy loam if placed under a hand glass. The flowers are yellow tinted with gold, veined and cut at the mouth.

CAMPSIDIUM

Handsome plants requiring a rich loam with leaf mould and propagated by layers in the rains. *C. Chilense* has flowers of a rich orange colour and tubular.

CENTROSEMA.

These are handsome creeping plants of considerable size, which may be propagated from seed or rooted runners. *C. Grandiflora* has purplish flowers and *C. Virginianum* bears flowers of much the same colour; while *C. Plumeri* has white flowers with a puce spot.

CEROPEGIA.

These are pretty climbing plants with most curious and pretty flowers. Some of them are bulbous and others are fibrous rooted. *C. Gardneri* is a fine species with creamy white flowers marked with purple blotches. They die down after flowering and spring up again from their roots. Propagated by division of the roots and from cuttings. After dying down they should be watered very sparingly.

CISSUS.

This is a plant of great beauty having ornamental foliage, being variously mottled with red, white and dark green and borne upon red foot stalks. They grow best in a dark corner of the conservatory, and thrive vigorously and display the splendour of their leaves in a humid atmosphere. They may be planted in pots in a well-drained and porous soil. They are easily propagated by cuttings placed in sand under a glass. There are many varieties with insignificant flowers.

CLEMATIS.

The Virgin's Bower does very well in the hills and are most charming plants in a large number of varieties. They enjoy a good light soil. Frequent watering with liquid manure assists them in flowering very much. Propagated by layering which takes a year to root, but is the most certain method. Cuttings do not strike readily and seedlings are two or three years before they flower. There are many types of Clematis, each with their varieties.

CLITORIA

The Butterfly Pea is a slender creeper flowering at all times. They are easily raised from seed and may be grown in a pot in ordinary soil. The flowers are various in colour, both single and double, in blue, sky blue, white and purple.

COBAEA

C. Scandens is an ornamental creeper of large growth with large deep purple bell-shaped flowers. The seeds are flat and should be planted edgewise, a very small percentage germinates. In the plains sow in October and in the hill stations either in October or in April-May. In the plains they do not readily live to a second year but are perennial in the hills. If lime and brick rubbish is mixed with the soil, the colour of the flowers is intensified.

COMBRETUM

These fine flowered plants are difficult to propagate and firm, short jointed cuttings of young shoots should be selected for striking. They flower in the cold season and in pruning should be thinned out. The flowers of the various varieties are all of a crimson or carmine colour.

CORYNOSTYLIS

These are elegant climbing shrubs, with handsome large white flowers with five petals, the lower one being the largest and drawn out below into a large pouch, which is compressed on both sides, constricted in the middle and twisted.

CYANOTIS

The Wandering Jew is a plant of a prostrate creeping habit, with very pretty leaves, hardy and common. They are admirably adapted for rockeries and in the plains

should be grown in a conservatory. They take root at the joints as they creep along the soil.

DELIMA.

D. Sarmentosa is a handsome climbing shrub with fragrant white flowers in loose, terminal racemes. Propagated by cuttings during the rains.

DIPLADENIA.

These are climbers of great beauty which are successfully grown in plant houses. They require a soil resembling peat broken up with silver sand, with perfect drainage. Propagated by cuttings. *D. Amabilis* bears very large rosy crimson flowers in huge clusters; *D. Amœna* is pink, suffused rose; *D. Bolivensis* is white with a yellow throat; *D. Brearleyana*, one of the best, is pink changing to deepest crimson; and *D. Carissima* is a lovely large flowered variety of a soft blush pink.

ECCREMOCARPUS.

Very elegant and beautiful slender climbers bearing tubular flowers. They do best in a rich soil in the hills but do not succeed in the open in the plains. They may succeed grown in a conservatory. Propagated by seed sown in March. *E. Longiflorus* has yellow flowers and *E. Scaber* is scarlet or deep orange.

ECHITES.

The Savannah Flower is a light climber with fragrant flowers. *E. Caryophyllata* is clove scented and has star shaped white flowers with curiously twisted petals. *E. Rubro-venosa* is a yellow flowered variety with ornamental foliage.

EPIPREMNUM.

E. Mirabile is very pretty trained up a tree and resembles *Monstera*.

FICUS

The Ivy Fig, *F Repens*, is a pretty creeper with small leaves, which attach themselves to trees or walls against which they may be growing, after the fashion of the Ivy. The variety *F Stipulata* has larger foliage.

HEDERA

The Ivy, *H Helix*, does not generally thrive in the plains but grows without any care in the cooler climates of the hill stations. They do best when placed in a northerly aspect in the plains, but do not make much growth.

HEXACENTRIS

A large climber which must be kept well pruned in, as it takes up much space if allowed to grow on without check. The flowers are borne during the cold season and are orange red and rather pretty.

HIPTAGE

The Creeping Chestnut, *H Madablota*, is a heavy climber with yellow and white flowers which it produces in great profusion during the cold season. Propagated by seed and layers.

HOYA

The Wax plant is a most beautiful and interesting genus, grown easily from a single leaf, with the leaf stalk half buried in the sand, and also from cuttings. They all require a very porous soil with a drainage of potsherds, leaf mould, cocoanut fibre, or moss all mixed together. They love to grow in the shade and require a bamboo trellis to grow upon. *H Carnosa* has pink flowers with a pink crown, *H Parasatica* has straw-coloured flowers with a pink crown, *H Potsu* has buff-coloured flowers, and *H Mollis* is white with a purple crown.

IPOMEA.

The Ipomeas are very pretty creeping plants; some of them are extensive climbers and cover large trees to their tops. They are most useful for covering trellises and many of them are very handsome. They may be grown in any garden soil and do not require any particular treatment. They are propagated from seed and are to be had in various colours. *I. Rubro-coerulea* is one of the best with beautiful large azure blue flowers.

JACQUEMONTIA.

J. Violacea is a rapid growing light climber with pretty blue flowers and thriving in a partially shaded situation in a good rich soil. Propagated by layers.

KENNEDIA.

These are bean-like climbers or prostrate plants, thriving very well up-country but not doing so well in lower Bengal. They are rapid growers and prefer partial shade. The seed may be sown just before the rains commence. *K. Marryatæ* has light scarlet flowers and *K. Rubicunda* is dark red.

LAPAGERIA.

This is a most beautiful creeper which is propagated from seed. Few climbing plants are so handsome showing a great profusion of bell-formed pendant flowers, generally of a rose colour spotted with white. They may be grown from baskets or rustic work or in pots with a bamboo trellis work. They are best when planted in a well-drained bed. It is a very important point to secure as good drainage as possible. Their roots must be enclosed within a space surrounded by brick tiles to within a square yard, or they will send out suckers. In the plains they should be grown in a plant house. They are best, however, suited to the hills as they require to be kept cool in March, April and May. Plenty of water must be given to them while

growing and syringing is highly beneficial till the flowers open. Green fly, a very common pest, must be kept in check. *L. Rosea* is rosy crimson and *L. Alba* is white and is a lovely variety.

LONICERA

The Honeysuckle, *L. Chinensis*, is a well-known climber bearing light-yellow flowers of an exquisite fragrance. It grows in any ordinary garden soil with no particular care, except to be trimmed when it goes beyond bounds. The variety *L. Caprifolium* has yellow flowers with a bluish tube and will only grow in the hills. Other varieties are *L. Brachypoda* and *L. Quinquelocularis*.

LOPOSPERMUM

L. Scandens is a creeper of not very extensive growth. The seed should be sown in October, both in the hills and the plains, and two or three plants placed in a large pot. The flowers are large, of a pretty rose colour and of the shape of the Foxglove. They require a light rich soil.

MANETTIA

M. Cordifolia is a small creeper of slender growth, requiring a small bamboo trellis work to support it, and is very ornamental for conservatory purposes, requiring a small amount of shade. It is propagated by division of the roots. *M. Coccinea* has bright scarlet flowers with a white tube, spotted red, and the throat closed by yellow hairs. *M. Micans* has rich orange flowers.

MAURANDYA

M. Barclayana is a very delicate looking slender creeper with small snapdragon-like flowers of different colours—white, lilac, violet, blue and rose coloured. It needs a bamboo trellis work. The best time for sowing the seed is in October, and again in February, and it will grow

in almost any soil. It can be grown to perfection in pots or boxes and will live for years if trimmed of decaying foliage and protected from frost. It flowers throughout the year.

MELODINUS.

M. Monogynus is rather a large climber with white fragrant flowers in crowded terminal panicles. It bears fruit the size of an apple. Propagated by seed or cuttings, put down during the rains.

MINALOBATA.

Ipomea Versicolour is a lovely climber, which is sown as an annual in India, flowering well the first year, although a perennial. The flowers are produced in quite a different form to the genus; they are in sprays like bells, crimson when first opening, then changing to yellow. In the plains sow in June and again in October and in the hills in Spring.

MYRISPHYLLUM.

A lovely little climber with beautiful spray-like branchlets used in the composition of wreaths and bouquets, etc. The flowers are inconspicuous but are scented. Propagated by seed or by division and is best in partial shade.

NEPENTHES.

There are many varieties of the Pitcher plant, as beautiful as they are curious. Their leaves are curiously formed with a tendril at the end bearing the pitcher, in some varieties coloured most gorgeously. They thrive in a slightly shaded situation, in a well-drained moist soil. Propagated by cuttings, layers and seed. The flowers of all the varieties are insignificant; their beauty consists in their leaves and pitchers. They require a close humid atmosphere and a light rich soil.

PASSIFLORA

The Passion flowers are a most extensive and beautiful genus of climbing plants. They bear tendrils to support and assist them in climbing. They are all propagated by cuttings and layers. In hill stations they require to be protected in a glass conservatory during the winter. *P. Cærulea* is a common variety but one of the prettiest. It flowers during the rains, calyx and petals pale greenish white, rays purple, white in the middle and blue at the ends. *P. Alata* has fragrant crimson flowers variegated with white and purple, *P. Coccinea* is scarlet, *P. Kermesina* with carmine crimson flowers, appearing in the shade throughout the hot and rainy season, *P. Laurifolia* with large blue fragrant flowers, *P. Princeps* with handsome scarlet flowers, and *P. Heterophylla* with exquisite yellow and crimson flowers. The edible variety, *P. Edulis*, thrives and fruits in the hills.

PERGULARIA

The Cowslip creeper, *P. Odoratissima*, is a slender plant bearing flowers of a dull greenish yellow colour of a most delightful fragrance. They are small and are borne in clusters and are hidden among the leaves. It will grow in any good garden soil and is propagated by layers or from seed which it bears during the cold season.

PETREA

The Purple Wreath, *P. Volubilis*, is a rather stiff creeper, but is a most lovely object when in bloom covered with its azure blue clusters of star-formed blossoms, in perfect wreaths almost draping the whole plant in colour, during the cold months. Propagated by layers or from suckers.

PHASEOLUS

The Greek creeper, *P. Caraculla*, has a most peculiar flower, purplish rosy white and yellow mixed, having some

resemblance to a snail. The flowers are sweetly scented. They are raised from seed during the rains but frequently die off during the cold season. They should be grown in a large, well-drained pot and should be cut in at the approach of the cold season. *P. Lobatus* has yellow flowers and *P. Semi-erectus* is greenish, tinged purple.

PHILODENDRON.

These are epiphytal climbers with ornamental foliage and are easily grown in grass conservatories. They are easily propagated by division of the stems, which take root as they creep along the ground. They are cultivated in the same way as Anthuriums.

PORANA.

The Bridal Bouquet, *P. Paniculata*, is a heavy climber with white, sweet-scented flowers which are borne most profusely in large panicles. Propagated by layers and cuttings.

POTHOS.

These are epiphytal climbers propagating themselves from wherever the stems meet the soil. The foliage is ornamental and they are useful for covering the trunks of trees and walls. *P. Argenteus* has green leaves splashed with silvery grey; *P. Argyreus* has silvery grey foliage and *P. Aureus* has golden yellow foliage.

QUISQUALIS.

The Rangoon creeper is a heavy climber bearing very effectively coloured flowers during the hot season and the rains. The flowers are white the first day and fade to red the next. Should be cut down during the cold season. Propagated by layers and cuttings.

RHYNCOSPERMUM.

R. Jasminoides is a small creeper bearing pretty fragrant white flowers, the corollas of which are twisted. A

choice plant which in the hills is almost always in flower, except in the depth of winter

SMILAX

This is a large genus but only a few are eligible for the garden. Some of them are highly ornamental. Most of them are creepers, and those with ornamental and variegated leaves are grown for their foliage. A sandy loam suits them best.

SOLANUM

The Potato creeper is a slender climber suitable for growing in a conservatory or other shaded situation. *S. Wendlandii* has flowers of a lilac blue colour, in clusters from the ends of the branches, which last a long time in perfection. A light rich soil suits it. *S. Jasminoides* is quite jasmin-like with clusters of sweet scented jasmin-like flowers of a waxy white. *S. Seaforthianum* has clusters of blue flowers. They are propagated by cuttings.

STEPHANOTIS

The Creeping Tuberose, *S. Floribunda*, is a choice, beautiful and ever popular creeper, well known and cultivated in India. The flowers are of the purest white, very fragrant and borne freely in large bunches of most exquisite waxy, tubular form. The drainage should be carefully attended to in the pots the plants are grown in or they are liable to die off suddenly in the rains. The compost should be light and manured with leaf mould chiefly. They are best grown in the conservatory. In the hills they cannot be grown in open beds. They are propagated by cuttings which are put down in sand in the rains and covered with a hand glass. By March they become well rooted and may be transferred to separate pots and trained to a trellis. They begin to grow in the Spring in the plains.

TECOMA.

These are splendid creepers with beautifully cut foliage. They can be propagated by cuttings and layers. *T. Radicans* is a handsome plant with orange scarlet flowers in large corymbs. Its branches take root wherever it touches the ground. *T. Grandiflora* has brick red flowers and *T. Jasminoides* is white with a red throat.

THUNBERGIA.

Very pretty climbing plants which require a trellis, or they may be grown in hanging baskets. The seed should be sown in October in the plains and in the Spring in hill stations. *T. Grandiflora* is a very extensive creeper with large pale blue flowers. *T. Alba* has white flowers exactly the same size and shape as *Thunbergia*. *T. Fragrans* is a small creeper bearing at all seasons fragrant white flowers. *T. Alata* is buff with a purple throat. *T. Coccinea* is scarlet and *T. Aurantiaca* is orange with a purple eye.

TROPAEOLUM.

These are beautiful plants, very graceful when trained over a globe-shaped trellis. Three or four tubers should be placed in a pot and the compost used should be equal parts of leaf mould, loam and sand. The plants will not succeed in the plains. Water sparingly till they have formed roots and the pots should be well drained. The bulbs should not be disturbed when the plants are growing. Grown over pillars and rafters in a green house they are most attractive. They require to be somewhat protected from the heavy rain of the monsoons and extreme cold in the winter. *T. Azureum* is a splendid azure blue; *Tricolorum* is yellow, scarlet and black; *Jaritti* is scarlet, orange and black; *Polyphyllum* is in long trusses of yellow, and the Canary Bird flower, *T. Peregrinum*, has elegant fringed-like pale yellow flowers.

UVARIA

U Odorata is a shrubby climber, flowering in the rains, with sweet scented yellowish flowers. Propagated by cuttings.

VALLARIS

V Hyneana is a shrubby climber, flowering in the hot season, with sweet scented greenish white flowers. Propagated by cuttings.

WISTARIA

W Chinensis is a truly lovely plant and is beautiful trained up the wall of a house, but when cut back can be made to form a bush. Though not suitable to Bengal, it flourishes up country, especially in the hills, where it flowers in a leafless state in great profusion in the spring, with huge bunches of lovely delicate lavender purple flowers quite covering the plants. *W Japonica* has white flowers in large racemes. *W Chinensis* does not like a calcareous soil.

Chapter Four.

PALMS.

ARENGA.

A. *SACCHARIFERA* is a handsome palm with its fine dark green plume-like leaves. Economically it is a very useful plant; the pith is used for making sago and the juice for making sugar. There are two other varieties, *Obtusifolia* and *Wightii*, which are only slightly different from *Saccharifera*.

ARECA.

These are very pretty palms and make handsome indoor decoration. There are two species, *Oleraceæ* and *Catechu*, the Betel Nut, both forming lovely ornaments in any garden. Propagated from seed in any good soil.

ASTROCARYUM.

These are ornamental palms. *A. Argenteum* has its leaves arching and covered with a white scurf, giving the plant a silvery appearance. *A. Filare* is a slender plant and should be grown in a conservatory.

CALAMUS.

Generally these are too large for the garden, but when young they do admirably for house decoration. They grow very slowly. Some of them are useful and beautiful as

specimens on large lawns and the smaller species will do for the conservatory

CARLUDOVICA

These are low growing plants of a very ornamental character and are splendid for sub-tropical gardening. They are easily grown and are propagated from seed. The following are varieties, *Atrorivens*, *Drudei*, *Ensiformis*, *Humilis*, *Palmata*, *Rotundifolia* and *Wallisii*.

CARYOTA

There are about a dozen species of the Fish tail palm. *C. Cumingii* is one of the best. Other varieties are *Maxima*, *Rumphiana*, *Sobolifera* and *Urens*.

CEROXYLON

These are handsome palms of South America and require the shelter of a glass conservatory and probably more shade than most palms. *C. Andicola* is the Wax palm of New Grenada.

CHAMAEDOREA

Very handsome palms, chiefly natives of South America and Mexico, and there are several varieties that can be grown successfully in this country. They are mostly all slender dwarf species and very beautiful. *C. Desmoncorioides* assumes a climbing habit after attaining a certain height. *C. Elegans*, *Formosa*, *Sartorii* and *Wendlandi* are some of the best varieties.

CHAMAEROPS

These are handsome palms of a dwarf nature and are propagated by offsets or by seed and are best grown in a strong loam, a little sand and leaf mould. The best are *C. Humilis*, *Macrocarpa*, *Maritima* and *Fortunei*.

COCOS.

These in their native habitats grow to large and majestic proportions. To this genus belong the Cocoanuts. There are several varieties, but the best are *C. Plumosa*, highly ornamental with edible fruits, the size of acorns; *C. Australis*, *C. Schizophylla*, a dwarf variety, and *C. Weddeliana*, probably the handsomest variety.

CORYPHA.

These are fan palms and rather ornamental in a full grown state. *C. Umbraculifera* has large leaves forming a complete circle. *C. Australis* and *C. Gebanga* are other varieties.

DESMONCUS.

A genus of very ornamental palms, with leaves pinnate and prickly with long ascending slender stems. When young they are at their best for table decoration and when older they may be trained over a pillar or rafter of the conservatory.

DIPLOTHEMIUM.

These are noble palms, almost stemless, admirably adapted to pot culture. The compost best suited to them is a turfy loam, chopped cocoanut fibre, sand, charcoal and pieces of mortar. Propagated by seed. *D. Maratimum* and *D. Candescens* are varieties in cultivation.

DRYMOPHLOEUS.

A genus of about a dozen palms which are unarmed, with slender ringed trunks. *D. Livæformis* is so called on account of its olive-shaped fruit and *D. Singaporensis* is of a drooping habit.

EUTERPE.

These are natives of America and the West Indian Islands. Their leaves fall off completely leaving a clean

stem up to the base of the next leaf. They require a rich loamy soil to be grown to perfection.

GEONOMA

These are handsome palms of a dwarf habit, with slender smooth stems. They may be grown successfully in a grass house, and in a young state are especially adapted to table decoration. They must be grown in shade and be watered copiously. *G. Elegans* is of slender habit and *G. Gracilis* is a graceful species with arching leaves. *G. Princeps*, *Pumila*, *Schottiana* and *Undata* are other ornamental species.

HEDYSCAPE

H. Canterburyana is a tall slow growing palm and rather ornamental.

HYOPHORBE

These palms are natives of Bourbon and Mauritius Islands, and are of most handsome growth. The flowers are white and the berries are olive shaped. *H. Amaricaulis*, *Indica* and *Verschaffellii* are the best known species.

KENTIA

A handsome genus of palms, requiring plenty of pot room and water. In appearance they are much like *Areca*s and make beautiful indoor decoration. *K. Belmoreana*, *Australis*, *Macarthurii*, *Robusta* and *Wendlandiana* are amongst the prettiest species.

KORTHALSIA

These are closely allied to *Calamus* and are natives of the Malayan Archipelago and New Guinea. *K. Junghuhnii* has long stalked leaves ending in a tendril-like shoot, *K. Scapigera* is armed with short spines and the young leaves are covered with white hairs.

LANTANIA.

These are fan-shaped palms, natives of the Mauritius Islands. They are rather difficult to grow in India, and are propagated by seed. *L. Commersonii* has gracefully incised and curved leaves, the segments of which are margined with a chocolate coloured band and edged with fine spines. The stem is smooth and slender. Other species well worth growing are *Aurea*, *Bourbonica*, *Glaucophylla*, *Loddigesii* and *Verschaffeltii*.

LICULA.

These are handsome palms with fan-shaped leaves and prickly stalks. They are all of easy cultivation and most useful for the decoration of grass conservatories. *L. Prichardia* is the handsomest and most choice of them all. Other fine varieties are *Peltata* and *Rumphii*.

LIVISTONA.

L. Mauritiana is a handsome palm when young and grown in a pot; *L. Australis* has dark green leaves, much plaited and divided at the edges; and *L. Rotundifolia* is another most handsome species with circular, rather erect leaves.

MARTINEZIA.

M. Granatensis, *Erosa* and *Caryotæfolia* are about the best. They are armed all over the stems, leaf stalks, and in most cases the leaves, with long spines. They are very handsome grown in a grass conservatory.

OREODOXA.

Ornamental palms much used for table and indoor decoration. *O. Olearacea* has arched leaves, drooping gracefully. *O. Regia*, the Royal palm, is very handsome and ornamental.

PHOENIX

These are the Date palms and are grown easily from seed. They are handsome for pot decoration. *P. Dactylifera* is the Date Palm and *P. Sylvestris* is the Sugar Palm. *P. Rupicola* is the Common Date of this country.

PINANGA

These are probably our handsomest palms, and are propagated from seed. The finest are *P. Maculata*, has its leaves spotted on the upper surface with dark green, *P. Spectabilis*, *Leitchii*, *Sanderiana*, *Putula* and *Malaisiana*.

PRITCHARDIA

These include some of the handsomest palms grown. They thrive well in India. Like all palms, they require careful watering, and lots of it during the hot months. The best are *P. Grandis*, *Pacifica*, *Periclarum* and *Vuylslekiana*.

PRYCHOSPERMA

A genus of unarmed palms which are very handsome, requiring lots of water during the hot weather. *P. Alba*, *Alexandrae* and *Seemanni* are fine species.

RAPHIS

These are very pretty, more cane-like than palm-like, and are suited to the conservatory. *R. Flabelliformis* is the fan leaved ground rattan cane of China. There is a variegated variety of this with the leaves striped with white. *R. Humilis* is low growing but otherwise much like *Flabelliformis*.

STEVENSONIA

S. Grandifolia is an exceedingly handsome palm and is one of the handsomest cultivated. It is stemless and from its base start the stalks, which are coppery and armed

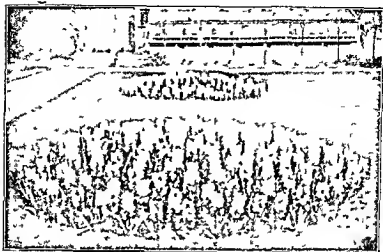
with black spines, more so when young. The leaves are of a cinnamon brown colour. It succeeds well in the plains in grass conservatories, in a moist atmosphere. It is best grown in turfy loam, sand and leaf mould and is propagated from seed.

THRINAX.

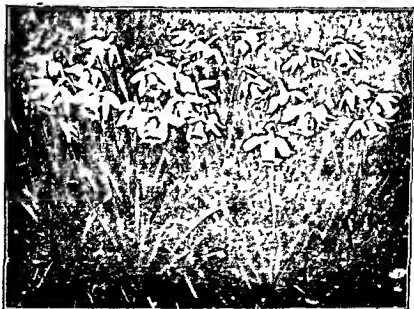
The genus includes some very handsome species which differ much in general appearance. They are propagated from seed which should be sown fresh. The best of these palms are *T. Argentea*, *Excelsa*, *Elegans*, *Gracilis* and *Parvifolia*.

WALLICHEA.

These are handsome palms suitable for pot culture and doing well in a grass conservatory. *W. Caryotoides* and *Densiflora* are the finest.



HYACINTH



MADAME DE GRAAFF DAFFODILS

Chapter Five.

BULBOUS AND TUBEROUS ROOTED PLANTS.

ACHIMENES.

Nat. Order Gesneraceae.

THESE are beautiful plants most easily grown, and there is a large variety of most lovely colours to choose from. They grow prettily in wire baskets, and as they are also suited to grow in pots they make a most desirable room decoration.

Achimenes are propagated by division of the tubers, and as these are easily injured by rough handling, they must be very carefully sown. The pots or pans they are grown in should be shallow and well drained, and the soil an open one, composed of sand, good garden soil and leaf mould with some cocoanut fibre mixed with it.

They may be started into growth by watering about March in the plains and April in the hills. The application of liquid manure during the period of growth is of great benefit.

After the flowering period, which will be towards the end of the rains, and the plants have died off the tubers should be taken up and stored away on a dry shelf. Some gardeners prefer leaving the tubers in their pots till the following season.

In the hills if early results are desired the tubers may be started into growth as early as February or March by plunging the pots into a hot bed

AGAPANTHUS

Nat. Order Hemerocallidaceae

The flowers of most of the varieties of this African Lily are blue or white and extremely handsome. In the plains it is more suited for the conservatory, and unless it has an abundance of air, light, shade and moisture the flower will not have the beautiful colour which characterizes it. The plant should be re-potted in February in a mixture of rich garden soil and leaf mould with a little well rotted cow-dung, and allowed to remain till it begins to grow freely. It should then be plentifully supplied with water. Towards the end of May the pots should be stood in pans of water.

The *Agapanthus* should flower in April or May, sending up a flower stalk of two or three feet in height, producing umbels of extremely beautiful, intensely bright blue or white flowers, which blow in succession.

When the plants have finished flowering they should be gradually dried up by withholding water, and when the bulbs have dried sufficiently and the fibrous roots cut off they may be divided up for the following year's planting. The pots used for growing this plant must be very large and very good results have been obtained by growing them in the open border.

They may be propagated by seeds as well by sowing them in pots plunged in hot beds in October in the plains, or in the same way in hill stations, but sown as soon as the seed can be obtained fresh.

AGLAONEMA.**Nat. Order Aroideae.**

These plants are allied to the *Arum* and must be treated in the same manner, but in grass conservatories, in a compost of leaf mould, old mortar, crocks, sand and loam. In the hills they will require the protection of a glass conservatory. They are propagated by division and cuttings inserted in sand under a hand-glass.

ALLIUM.**Nat. Order Liliaceae.**

These are very pretty bulbous plants, easily grown in a light soil in the hills and North West Provinces. They require good drainage. Plant in October, and in the hills in November and close of February or March. There are many varieties, among them being *Allium giganteum*, a remarkable plant, the flowers being borne in huge globose heads, three to four inches in diameter, of a bright rose purple colour.

ALPINIA.**Nat. Order Zingiberaceae.**

A large genus of handsome foliage plants, easily propagated in the plains by division of the roots, which are fleshy, branched and having the taste of ginger. They require a very rich light soil and copious watering. Frequent watering with liquid manure is beneficial to them when in growth. If well cultivated they bear flowers and require lots of pot room. When they have done flowering during the cold season they should be allowed to rest.

ALSTROMERIA.**Nat. Order Amaryllidaceae.**

A most curious genus of plants, their leaves taking a twist near their stalk. Their roots differ in different varieties; some are fibrous, while others are bulbous.

The tubers should be placed in rich sand and loam and watered freely. They should be grown in large sized pots in light rich soil in partial shade, and allowed to die down after flowering by lessening their water supply.

These plants will grow in the plains but succeed much better in the hills in this country. Frame varieties are much more likely to give good results in the plains and do well in hill stations.

The tuberous rooted hardy kinds should be planted six inches deep in a light well drained loamy soil. The frame varieties require much the same treatment and should be freely watered, but the supply should be diminished during the resting period.

The difficulty is to get these bulbs in proper time for the plains, as they should be put down in October, and are not ready in Holland till August. The only way is to put them down as soon as received, either in the plains or hills, and if they do not flower in the first year, they will the following season.

AMARYLLIS

Nat. Order Amaryllidaceae

These are very pretty flowers, of large size, borne on a scape of from one and a half to two and a half feet in height. There is a large variety of them, all of which are easily cultivated, and with good management a succession of bloom may be kept up throughout the season. The flowers are trumpet or bell-shaped and lily-like and their colours range from the richest crimson, through a variety of stripes, to pure white.

Grown in pots or tubs, they do well with a light soil and good drainage. Two parts light rich soil and one part leaf mould suits them well. From the time they start into growth they should be copiously supplied with water, and when they have done flowering, this should be withheld.

After the leaves have died down, the bulbs should be left in their pots till the following January, when they should be taken up, divided and re-potted afresh. When planting the offsets, half the bulb or a little less should be left out of the soil. In the hills March or April is the time to plant.

ANEMONE CORONARIA.

Nat. Order Ranunculaceae.

The Florist's anemone is a charming plant, of small growth, bearing exquisitely pretty cup-shaped flowers, both single and double, of numerous colours. The seeds may be sown at the approach of the cold season in the plains, and in the early Spring in hill stations. Tubers may also be imported and should be planted in October in the plains and in the hills in January or February.

Both tubers and plants grown from seed wear out and must be freely supplied with liquid manure. They should be grown in a light rich soil mixed with leaf mould. The seeds should be sown about an inch deep, and if tubers are planted, a little silver sand should be put in under the bulb, to prevent rot. Water should scarcely be applied until the bulbs have well sprouted. The soil should be well drained and the application of liquid manure will prove beneficial. In selecting tubers for planting, pick moderate sized and plump ones, as the larger sized ones are generally hollow.

A perfect flower should have its petals start away from the centre nearly flat, and then turn up at the ends, so as to be the shape of a cup; the different colours should be distinct and clearly defined. The double varieties are the finest, but there are some single ones exceedingly beautiful.

Seeds should be procured as fresh as they can be got, and sown as soon as received, for they will not stand exposure in this climate.

There is a caterpillar that does great havoc among these plants. Examine the plants every day and destroy all insects found.

ANTHERICUM

Nat. Order Liliaceae

These include the St. Bernard's Lily, 1 *Liliago* and the St. Bruno's Lily, 4 *Lilium*. All are of easy culture and make pretty plants when well grown.

BABIANA

Nat. Order Iridaceae

Dwarf bulbous plants, of a numerous genus, natives of the Cape of Good Hope, bearing flowers of great beauty. They are not suited to the plains of India, though they do very well in hill localities. They enjoy a sandy soil mixed with peat and are of easy cultivation and free flowering. Like all bulbous plants it requires the pot it is grown in to be well drained. Plant in Spring in pots, and later on, if desired, they may be removed to the open border.

BEAUCARNIA

Nat. Order Liliaceae

Very graceful plants, with leaves narrow and drooping. The stems are slender with a curious swelling at the base. They require a light soil and good drainage, with a plentiful supply of water during the growing season. Propagated by seed or by cuttings.

BEGONIA

Nat. Order Begoniaceae

Elephant's ear. A very extensive genus of plants, having in many cases unique, beautiful and curious foliage. They are as a rule compact dwarf plants very useful for pot culture and decoration.

They have been divided into four sections; the Tuberous rooted or flowering section, the Rex or herbaceous section, the Shrubby section and the Discolour Rex section.

Begonias require a shaded position and are best grown in a conservatory, and a moist atmosphere appears to suit them best. Good drainage must be ensured and a most suitable compost is made up of two parts of good garden soil, two parts of decayed cow-dung, two parts of coarse sand, one part of cocoanut fibre refuse and one part composed of bricks, broken very small. To ensure that the pots are well drained, after having laid a good layer of crocks, place some pieces of charcoal above it.

The flowering section do well in the hill stations of India and have also been grown with success on the plains. They must be protected from rain under the shelter of a verandah and flower in the hills during June, July and August.

The tubers should be received in the plains in September and planted as soon as received. In hill stations the best time to obtain them is just at the close of the cold season, the pots being plunged in a hot bed. The tubers are much like a potato, but hairy with small roots. Out of these will start small red buds. The tuber should be planted with the bud just out of the soil and watered very lightly.

They are easily raised from seed; the bulbs, however, will not flower till the second year. The seed is very fine and when sown on the surface of a good sandy compost enriched with leaf mould, must be covered with a pane of glass and kept in a dark room till the seed germinates. The plants must be pricked out when quite small and planted two or three inches apart in a large pot. As they grow each plant must be potted off singly. In the hills seed should be sown in April; this method of propagation does not succeed on the plains.

Nowadays there are many firms which specialise in Begonias and some splendid strains can be had therefrom. The colours are most beautiful, dazzling and delicate, of immense size and of most perfect form.

The Rex section is easily propagated in silver sand from a well matured leaf. Take a shallow pan with good drainage and fill with silver sand with some powdered charcoal mixed. Take off a well matured leaf with about three inches of stalk and insert the stalk in the sand, then peg down the leaf so as to have its lower surface in contact at every point with the sand and then divide every one of the central veins of the leaf with a knife. At these incisions young roots will form and plants spring up.

The remaining two sections are not so much met with in gardens. The Discolour Rex varieties, when well grown, attain a height of one and a half to two feet. Their foliage is much smaller and not so well marked as that of the Rex section.

CANNA

Commonly known as Indian shot in reference to the seed which are round, hard and black, and of the size of small peas resembling shot.

A most useful plant for general purposes. The foliage is highly ornamental and tropical and this with the large and beautiful heads of, in many cases, the most vivid coloured flowers, is a decided addition to our gardens and holds a front rank as a bedding plant.

The cultivation of the Canna is simple. It is a gross feeder and no soil can be too rich for it. An open situation should be selected and the soil dug to the depth of two feet, well enriching it with manure. The roots should be planted rather deep about two feet apart. Water sparingly at first, but when the shoots begin to grow give copious waterings.

They can be planted in round beds or borders but are also very effective when grown in large pots or wooden tubs. The flower spikes after they fade, should be cut down to the ground and new shoots will rapidly take their place. Frequent doses of liquid manure while the plants are growing will be found beneficial. They can be transplanted at almost any time of the year, but the best time is about two or three weeks before the rains.

In the hills they begin to flower in May and June and go on doing so till the cold sets in. The plants should then be allowed to die down gradually by withholding water and the roots stored away till March, keeping them moderately moist.

The commonest method of propagation is usually by division of roots. New varieties are raised from selected seed, but these should be soaked in hot water to soften them, before sowing.

Black Knight.—Rich velvety maroon, bronzy green foliage.

Carl Haussman.—Orange terra-cotta.

Coquette.—Tomato red, a beautiful colour.

Duke of Connaught.—Vermilion scarlet.

Entente Cordiale.—Old rose.

Eureka.—Orange terra-cotta.

Flambeau.—Orange scarlet.

Fleur de Lys.—Pale carmine pink, bronzy green foliage.

Gaekwar of Baroda.—Yellow heavily spotted with crimson.

Golden Glory.—Lemon yellow.

Hector Grassler.—Orange changing to salmon pink.

Ivory Child.—Creamy white.

Lord Reading.—Crimson scarlet, large flowers.

Madame Jules Galban.—Deep orange, dark leaves.

Madame Nicholas —Deep tango

Orange King —Golden orange

Oriental —Yellow spotted deep pink, ends of petals tipped deep pink

Sunset —Orange terra-cotta

Vanguard —Carmine red, centre pale yellow spotted red

Vesuvius —Scarlet

CALLIPSYCHE

Nat Order Amaryllidaceae

These ornamental bulbous plants, which require to be grown in shade in a compost of sandy loam and leaf mould, are only successful in the hills. The name is derived from *Kallos*, a beauty, and *Psyche*, a butterfly, alludes to the flowers. They are propagated from seed, and when in a growing state, from offsets. They require plenty of water while growing and should be kept moderately dry in winter, though the foliage should die down.

CALOCHORTUS

Nat Order Liliaceae

These are very handsome bulbous plants, suitable for growing in the hills. They should be planted in a frame in February. As they require a good depth of soil and not too much moisture, they should not be grown in the open ground. Their cultivation is attended with difficulty, as nothing is more prejudicial than to receive their bulbs in a dry state, and this is not quite possible with imported bulbs.

CHINODOXA

Nat Order Liliaceae

A small bulbous plant suitable to hill gardens. Plant the bulbs in October in pots in light soil, and do not

divide the bulbs. They flower better in this way, and do best under a hand-glass or frame. Although it is best to plant bulbs, they can be propagated by division or seed.

CONVALLARIA.

Nat. Order Liliaceae.

The Lily of the Valley, so well known to most English gardens, is difficult to grow except under a hand-glass in the hills, or in a glass conservatory, as at the time it comes into flower the atmosphere is too dry for it.

On receiving the clumps they should be planted at once in a light soil, lightly placed about the roots, and they should then be forced on with a little bottom heat.

CRINUM.

Nat. Order Amaryllidaceae.

There are a great many varieties of this genus of bulbous plants, many of them being much alike. A few of them look well in gardens. Most of the varieties have leaves over a foot and a half or two feet long; some have even larger leaves, but they are narrower. Propagated by division.

CROCUS.

Nat. Order Iridaceae.

In the hills these may be planted successfully, in beds in almost any situation. They should not be planted more than an inch and a half to two inches apart, and in rows of different colours look exceedingly pretty. There are many colours to select from—white, yellow, purple, blue and red. They should be put down three at a time in the soil, and when the foliage has died down after flowering, the bulbs must be taken up again before the rains set in, to avoid rotting.

CYANELLA**Nat Order Liliaceae**

These are pretty little bulbous plants which bear various coloured flowers. They should be planted in October and watered sparingly till they begin to sprout. They are of very easy culture and if grown in the ground should be planted about four inches apart.

CYRTANTHUS**Nat Order Amaryllidaceae**

Very handsome bulbous plants which thrive in light, rich loamy soil, and do better in a grass conservatory than in the open, and in the hills with some shade. The flowers are incurved and tubular, and the leaves long and narrow. Propagated by offsets.

CYCLAMEN**Nat Order Primulaceae**

These beautiful plants are only suited to be grown in Upper India and the hills. They are best cultivated in a conservatory. Seed may be sown in September and early October under glass and given a certain amount of bottom heat. As the seeds begin to germinate the seed pans should be exposed to more air and placed in a partially sheltered spot.

In April or May the seedlings should be transplanted into large pots, three to five in each pot, where they will flower in the following cold season. The leaves are highly ornamental, and their beauty will be greatly enhanced by sponging the leaves with soap and water occasionally, or syringing with tepid water.

The soil in which they are grown should be a little sandy and mixed with leaf mould and a little manure. The pots should be well drained.

Cyclamen may also be propagated by planting bulbs and these should be planted only half of their depth in the soil. The plants should be allowed to die off by withholding water, at the end of the flowering period, and may be allowed to remain in the pots till the following season. When the bulbs begin to sprout again they should be taken up and re-potted.

EUCHARIS AMAZONICA.

Nat. Order Amaryllidaceae.

These very handsome plants have bulbs much resembling onions, large, polished and dark green. They thrive well in a light loam, leaf mould and sand, and bear pretty, waxy white flowers. The soil should have some rich manure and a little charcoal added to it.

The bulbs should be planted in October and watered freely in the growing state, using applications of liquid manure. After flowering the leaves should be allowed to die down and the pots kept away till the following October, when they should be top dressed with rich manure.

Propagation is effected by division of the roots.

EURYCLES.

Nat. Order Amaryllidaceae.

These are very handsome bulbous plants allied to the *Pancratium*. Their leaves are very broad and cordate and grow to a height of one or two feet. When planted out in the open ground, the bulbs are better left undisturbed, and allowed to come into flower of their own accord.

FREESIA.

Nat. Order Irideae.

These may be readily grown in the plains and the hills. In the plains the best time to put down the bulbs

is in September and October, and in the hills early in March. They may also be started in December with a little bottom heat, to flower in April. They can also be grown from seed but do not always flower the first year. A light rich compost suits them and are best grown in pots.

FRITILLARIA

Nat. Order Tulipaceae

These do not succeed well in the plains but give every satisfaction in the hills, if planted out in the border or in pots in light rich soil. The bulbs should be planted in the Spring and protected from the frost. There are many varieties, all having peculiarly marbled flowers.

GALTONIA

Nat. Order Liliaceae

When grown in the plains this plant requires partial shade and is best grown in a conservatory. It succeeds both in the open ground and in pots. In the plains the bulbs should be planted in October, and may be left undisturbed for years, only giving an annual surface dressing. In the hills they should be planted in February or early March, and if left in the ground for the winter, should be covered over with a mound of ashes or old refuse. The flowering spikes are from two and a half to three feet high, each bearing fifteen to thirty flowers of pure white colour.

GESNERA

Nat. Order Gesneraceae

Generally speaking these do not succeed in the plains, and in the hills, although requiring a little bottom heat, thrive and give very little trouble in a moist atmosphere. Most of them are tuberous rooted and require a well drained, light soil. Some of the succulent leaved varieties are multiplied by leaf propagation in the rains. Other

varieties are propagated by the increase of tubers, and cuttings of the shoots after the plants have just started into growth.

GLORIOSA SUPERBA.

Nat. Order Tulipaceae.

Except when grown with bottom heat in conservatories this plant is not suited to the hills. It is a slender creeping plant, and in many parts of India may be found growing wild in the low scrub jungles. It bears curious flowers; the petals are wavy, one half light yellow and the other half crimson, changing to a deeper shade as the flower grows older. In the cold season it dies down and comes up again the next year in the rains, when it flowers in great profusion. They may be grown in pots as well as in the open border, where they will come up year after year without any particular care being bestowed on them.

A watch should be kept on caterpillars which do great damage to the plants during the growing season.

GLOXINIA.

Nat. Order Gesneraceae.

This is a numerous genus of tuberous rooted pot plants with exquisitely pretty flowers. When grown in the hills they should be grown under glass with a certain degree of bottom heat. Entire shelter from the sun is best for them. Seeds can be sown in the hills any time from February to March, under glass, in a moist atmosphere. They can also be propagated by dividing the tubers and also from a single leaf, which is far the most rapid way of increasing good varieties. They do fairly well in the plains, but there is always danger of the young seedlings damping off or being dried up by the west winds. To avoid the former the seedlings should be pricked out and re-potted as soon as they can be handled, and great care must be taken in watering them.

Tubers are an easy method of propagation and should be started in the plains in October and November, and again in July and August, to obtain two crops of flowers. In the hills February or March is the proper season. The compost should be a mixture of cocoanut fibre, good garden loam and charcoal. After putting in crocks to ensure perfect drainage, the pots should be filled up with the compost and the tubers planted in it. Water should be sparingly given until the tubers start and then it should be increased. Watering with liquid manure when the plants are in flower will be very beneficial. When they have done flowering, dry off by withholding water, and store the tubers in a dry place.

The erect flowering varieties are the best, because their colours are best seen.

GLADIOLUS

These are herbaceous plants which are grown to perfection in this country, and are seen to the greatest advantage when grown in the border with a background of shrubs. Their stately habit and rich glowing colours make them extremely valuable as decorative plants.

They are divided into two sections, the *Ramosus* or summer flowering varieties and the *Gandarensis* or autumn flowering varieties. Both sections are beautiful and brilliant in colouring and when grown in masses make a gorgeous show. Other later types are the *Lemoinei*, the *Childsi*, the *Nanceianus* and the *Primulinus*.

The Gladiolus is usually propagated by the offsets which grow round the parent bulb, it is also grown from seed but is three or four years before it attains flowering size. It is easy of culture and does well in any open, sunny situation. It delights in a rich soil and giant exhibition blooms can be obtained by giving them liberal treatment, well mixing thoroughly decomposed manure into a soil

that has been finely prepared. Liquid manure may be applied with advantage. The surface soil should be kept constantly pulverized and water, when necessary, should be copiously applied.

As a cut flower it is exceedingly desirable. Besides being wonderful in its range of colour, the flower lasts a considerable time when used for the purpose of room decoration in bowls or vases. Owing to their lasting qualities the French place them in bottles and decorate their gardens, by sinking them in beds where there is a deficiency of colour.

The roots should be planted in the plains in October and in the hills in February or March. They are usually in flower about three or four months after planting. After blooming the flower stems should be cut out, and when the leaves are beginning to turn yellow, watering should be withheld till the leaves dry up. The bulbs should then be removed, thoroughly dried in the sun, and stored away in a cool dry place.

HAEMANTHUS.

Nat. Order Amaryllidaceae.

There are about thirty species of this lovely plant. Although they have been flowered successfully in the plains, they succeed best in the hills. They require a good rich soil and benefit greatly by applications of liquid manure applied during the period of growth and when the flower shoot is beginning to form. In the plains they should be grown in a conservatory.

HEDYCHIUM.

Nat. Order Scitamineae.

These are cultivated mostly in the plains in tubs and plant houses, and for sub-tropical climates are valuable in the same way as Cannas. They require a certain amount

of shade and moisture and grow well near the bank of a tank in the partial shade of trees, or in similar situations

HEMEROCALLIS

Nat Order Liliaceae

The most common variety found in gardens on the plains is *H. Fulva*, bearing reddish yellow flowers, which are sometimes double. It is propagated by division.

HIPPEASTRUM

Nat Order Amaryllidaceae

The Knight's Star Lily resembles very much the Amaryllis, with which it is often confused. They are more or less evergreen, and though they require a period of rest, should never be entirely deprived of water. Growing in almost any soil with little or no care, they succeed better when the soil is of a heavy nature. They do well in pots but also thrive in the open ground.

In the hills they will not stand the winter and have to be potted and brought under shelter from the frost.

They are easily propagated by division, as the bulbs increase rapidly. Seed is another means of propagation, but they must be sown as soon as ripe.

HYACINTH

Nat Order Asphodeleae

These flowers, both single and double, should be grown in pots of rich soil, mixed with sand. They grow with little success in Lower Bengal, except under glass to keep up a humid atmosphere. In Upper India they do well.

The bulbs should be procured early in October and planted as soon as received. In the hills the period of planting may be extended to February or March. The

bulbs are worthless the second season, hence fresh ones should be procured every year. The pots in which the bulbs have been planted should be given a certain amount of bottom heat and may be plunged into and entirely covered over with leaf mould until the bulbs begin to sprout. The pots should then be removed and kept in a cool shady place and each one covered over with another empty pot so as to keep out the light and induce lengthening of the stalks.

When the bulbs have sufficiently sprouted the empty pots may be removed and applications of liquid manure at this period will be found beneficial.

If it is desired to grow them indoors, they should be removed from the pots at this stage and all earth very carefully washed off and placed in a jar or glass filled with moss or chopped cocoanut fibre. Water should be liberally applied when the bulbs are in growth and they benefit greatly by being placed in the dew at nights.

After flowering, when the leaves have thoroughly withered, they may be twisted off, but the roots must not be cut or injured in any way. They should then be put in dry sand and allowed to dry in the shade, after which the dry portions of skin and rootlets may be rubbed off and the roots stored with their crown downwards and permitted to touch one another. Bulbs grown in sand, moss or fibre, when their flowers fade, must be planted out in open beds and watered well, after which they must be treated in the same way as bulbs grown in earth.

Hyacinths make a pretty display when grown in vases filled with moss or in glasses filled with water and for this there are many varieties of miniature Hyacinths available. The single white Roman Hyacinth is more suitable to the warmer climate of the plains and make a pretty display when planted three or four in a pot.

HYMENOCALLIS

Nat Order Amaryllidaceae

These handsome plants are of the easiest culture in the plains and the hills. The bulbs should be buried in the soil to their full depth, and the soil should be kept moist, especially during warm weather.

IRIS

Nat Order Iridaceae

These plants rival in beauty the handsomest and rarest orchids, and among the floral beauties stand prominent in the list of those which should decorate our borders and conservatories. The height of the plants is from eighteen to twenty-four inches. The cultivation is extremely simple, and no plant is more effective when planted in clumps of threes or fours, becoming more so each year if left undisturbed.

Roots of Iris should be procured from hill stations in October and planted out in the border. They may flower the first season, but if they do not, many will flower the second season. They should be watered well when they begin to grow. The roots should not be kept out of the ground for any length of time, but planted as soon as obtained in large well-drained pots, and kept in the conservatory or glass house. Most Iris flower better when planted in the ground and revel in a light sandy soil well manured with cow-dung. Propagated by division.

The Japanese Iris, both single and double in various colours, flowers freely in the hills. They require a season of rest in winter, and if planted in a bed require little or no protection during that time. When planted in pots they are rather shy bloomers.

IXIA

Nat Order Iridaceae

These pretty bulbs should be procured in October and given the same treatment as Hyacinths, and watered

sparingly till they send up their green shoots. When planted in the garden the bulbs should be put four inches deep in loam which should be made light with sand. Plant them four inches from each other. Grown in pots the bulbs should be planted only two or three inches deep. In a dry climate they are liable to suffer if grown in the open beds, so are better grown in pots or boxes. They succeed well in this country and are procurable in a variety of colours.

KAMPFERIA.

Nat. Order Scitamineae.

These are tuberous rooted plants, many of them with very pretty delicate coloured flowers. The species most commonly met with is *K. Rotunda* and *K. Galanga*, both bearing their flowers close to the ground, so are better grown in pots. Grown in the border, their roots are not unfrequently dug up or lost.

While in growth they should be copiously watered. When their flowers are over water should be withheld, when the leaves seem to be turning yellow.

KNIPHOFIA.

Nat. Order Liliaceae.

The Flame Lily or red hot poker flower is also known under the names of *Tritoma*, *Tritomanthe* or *Tritonium*. There are about sixteen species of this plant all natives of tropical Africa.

They are most showy, bearing mostly yellow, orange, red or scarlet flowers. They are of easy cultivation either in the plains or the hills, but at high altitudes, where the frost is intense, they require some leaves, sawdust or manure to be thrown over them to protect them. They are best planted in a sandy soil with a top dressing of old manure, and require copious watering during their growing season in spring and summer. In the plains they will do well in open beds, but are far more ornamental and grow better

in grass conservatories. The crowns should be left undisturbed during the season of rest. Propagated by division of the crowns, and by seed when they can be obtained.

LACHENALIA

Nat. Order Liliaceae

These bulbous plants are exceedingly pretty, and though they do very well in the hills and Upper India, they are grown with some difficulty in the plains. Propagated by division of the bulbs and should be grown in a mixture of good garden soil and leaf mould in pots, where they will flower as they do not like transplanting. A little cow manure may be added to the compost, but watering with liquid manure will be found of immense benefit.

The bulbs should produce from one to four spikes and should be planted in groups in pots. Draughts must be avoided as they stunt the growth and injure the foliage. They do not require heat, and if cultivated in the plains, should be grown in a cool and shady corner of a grass conservatory. Good drainage is essential.

In the plains they should be planted in October and in the hills any time from January to March.

LEUCOJUM

Nat. Order Amaryllidaceae

Very pretty hardy bulbs which bear spikes of flowers like large flaunting snowdrops. They all do well in the hills and one variety, *L. aestivum*, grows with success in the plains. They require rather a light loam and free watering when in growth. If the bulbs are planted in pots and kept in-doors in a warm room, they will be forced to flower very much earlier than they would out of doors.

LILIUM

Nat. Order Liliaceae

These exquisite floral beauties require to be cultivated in the shade or in a grass conservatory. They multiply

themselves and are propagated by division and by seed. They give great satisfaction in the hills where the bulbs should be planted in March, April and May. In the plains some of the finer varieties are difficult to grow.

The soil should be mixed with a little sand with lots of leaf mould and a little cow-dung and before planting, the bulbs should be steeped in strong tobacco water to keep away earthworms, which destroy the bulbs. While the plants are growing water should be given liberally and applications of liquid manure are beneficial.

After flowering, water should be withheld by degrees and the flower stem, when dry, cut off just above the ground. After this the bulbs may be taken up carefully and stored away in earth, but should never be allowed to get quite dry. If the plants are reared in pots, the drainage should be perfect. One large bulb is sufficient for a ten-inch pot, or two or three smaller ones according to their size. The bulbs in pots require to be planted from three to four inches deep in the compost.

A grand group of Lilies are those called *Archelirion*, and pre-eminent among them is the *Lilium Auratum* or Golden-rayed Lily of Japan. This bears flowers ten to twelve inches in diameter, pure white with a yellowish band through the centre of each petal, and covered with brownish dots. It is deliciously fragrant and one stem often produces six to ten immense blooms. In hill stations, during the winter seasons, spread some dried leaves over the beds they are planted in if grown in the open ground. Bulbs, when planted out of doors, should not be planted less than five or six inches under the garden mould. The bulbs should not be disturbed, when intended for established patches, in less than three years; and they should be started in May in small pots and planted in beds which they are to occupy. By not removing the bulbs they will flower much more profusely than those taken up and divided.

The Martagon lilies with flowers distinctly recurved when fully expanded are only suited to the hills, and are best for bedding out

NARCISSUS

Nat Order Amaryllidaceae

The bulbs are grown in stiff rich deep soil and thrive up-country and in hill stations, in Lower Bengal they do not do well and will not flower. They must be watered very slightly before they begin growing. The bulbs should be planted in September and should not be planted more than five inches below the ground, and rather less in pots. They may also be planted in January and February and in that case flower in spring. This also applies to Jonqui's and Daffodils.

To avoid them running to leaf and in consequence poor flowering, water must be sparingly applied at first. If planted in the ground they may remain undisturbed for many years, if grown in pots they should be shaded when in flower, which makes the bloom last longer.

The trumpet varieties are more difficult to deal with. The Chinese Sacred Lily is a Narcissus. When grown in water the bulbs are exhausted and should be planted in soil the following year. When grown in an aquarium a little sand should be placed in the bottom of the vessel, and the bulbs jammed in between a few small pieces of rock to hold them in position. The trumpet varieties flower best when planted in beds and do not flower readily in pots. They grow in water perhaps better than the others. When grown in water, the water will require to be changed and not grow stagnant. Grown in soil, as soon as the flower shoots appear, liquid manure may be applied with great advantage.

If the bulbs are taken up after flowering, this should not be done till the leaves are perfectly dry and the bulbs should be stored away in sand in a box.

NERINE.

Nat. Order Amaryllidaceae.

The Guernsey Lily belongs to this class and is called *N. Sariensis*. It does not thrive well in Lower Bengal. The flower of this plant is really beautiful, brilliant scarlet, and looks when the sun shines on it as if it was spangled with gold dust.

They should be planted in early August or September, and the bulbs when received from abroad, should be stored in a dry airy place till the time arrives for them to be planted. They do very well in the hills planted in a border, in a well prepared soil made up of loam and leaf mould, charcoal and sand.

Some of the species flower before sending out leaves. After the flowers have appeared they require no watering. In the hills they should be given a period of rest by withholding water.

OXALIS.

Nat. Order Oxalidaceae.

A very pretty genus of small flowering bulbs, which flower freely and in profusion in all parts of India and do not deteriorate from climatic influences. They should be grown in a pretty rich soil composed of leaf mould, loam and sand, and may be planted in pots or among rock work. They grow best with a moderate amount of shade, when their leaves, of a beautiful rich green, are seen in perfection. After flowering their leaves show signs of decay; they should then be allowed to die down by gradually withholding water and the bulbs stored away in sand and kept dry. They should be divided again in the beginning of October and re-potted at about an inch and a half to two inches apart. This is absolutely necessary as they never flower well unless they are divided and placed in fresh compost.

PANCRATIUM

Nat Order Amaryllidaceae

These small bulbs require little care bestowed on them further than planting them in the open beds and borders of the garden. Their flowers generally come out in the hot weather after a shower of rain, are fugitive and white. The bulbs are better by being left undisturbed where they are planted for years.

PARDANTHUS

Nat Order Iridaceae

The Leopard flower is by no means uncommon in our Indian gardens in the plains. They have Iris-like leaves and rather pretty orange coloured flowers with scarlet spots on them, borne on tall foot stalks from two to three feet high. They grow without any particular care in almost any soil and are most easily propagated by division.

PHALANGIAM

Nat Order Liliaceae

Dwarf bulbous plants with linear leaves. Also known under the name of *Anthericum*. They require cultivation in a light soil composed of loam, coarse sand and leaf mould, and are propagated by division.

The St Bernard's Lily is the *P Liliago* and the St Bruno's Lily is *P Liliastrium*.

POLYANTHES TUBEROSA

Nat Order Amaryllidaceae

This is one of the commonest of our garden plants and propagated by division. It grows without any particular care in the plains, and is a most delightful addition to gardens with its very fragrant white tube-like flowers borne on the top of a spike from three to five feet in

height. In the hills it should be cultivated with much manure at the roots or bottom heat should be applied to make it flower.

The flowering spikes should be cut down after the flowers fade. There are very handsome double flowering varieties which bear splendid clusters of flowers, but these are not so fragrant as the single varieties. The stems of these varieties should be supported with stakes to prevent them toppling over with the weight of the flower head.

RANUNCULUS.

Nat. Order Ranunculaceae.

This requires a retentive soil mixed with good and well decomposed stable manure and a certain quantity of leaf mould. There should be at least twelve inches of good rich soil to ensure the successful culture of this plant. Plant the tubers in October. They may be planted in beds or pots with a sprinkling of sand under each tuber. They should be pressed down firmly about five inches apart from each other, claws downwards and crowns upwards, and covered over with sand.

After they have done flowering the tubers must be taken up; for if left in the soil they will start again into growth and die off. The plants should never be allowed to seed as this spoils the tubers. When the roots are taken up they must be dried in the shade and kept free from damp and stored in boxes of dry sand.

When they are in bud watering with liquid manure is highly beneficial and will improve the flowers. Insects are apt to attack the foliage, especially a variety of caterpillar which must be destroyed.

There are many varieties among which are the Persian, Scotch and Turban, all with truly beautiful flowers. The usual method of propagation is by offsets.

In hill stations, January is the best time to sow the tubers.

SNOWDROP

Nat Order Amaryllidaceae

Most exquisite, valuable little flower plants, as they bloom so early, and may be grown in-doors or in rows with Crocuses, when they are very effective. They grow, however, best and bloom best when planted out, as they require all the cold they can get in this country, even in the hills. The best time to plant them is in October, in any case not later than November.

SCHIZOSTYLIS COCCINEA

Nat Order Iridaceae

Flowers that are quite hardy. The rhizomes may be planted at any time in the border or in pots, preferably in the former. They bear spikes of flowers much like *Iris*, but deep scarlet in colour. The soil they are grown in should be of a light sandy nature manured with leaf mould.

SCILLA

Nat Order Liliaceae

These bulbous plants only do well in the hills and should be planted in October in the open border, in a light soil which incorporates a good deal of leaf mould. The spot planted should be covered over in Winter with a little straw as protection against the weather. It is known as the Cuban Lily. The bulbs should be planted four to six inches deep. When the plants have done flowering, water should be withheld and the bulbs taken up, dried off and then stored away in a dry, cool place.

SPARAXIS

Nat Order Iridaceae

These lovely little plants do well in the plains or hills. October is the best time for planting in both situations, but require protection during winter in the hills. A good rich light soil suits them best, manured with

leaf mould. When in bud, or just before they come into bud, water with liquid manure and the flowers will be better and more plentiful.

SPREKELIA.

Nat. Order Amaryllidaceae.

The Jacobea Lily. Very handsome Amaryllis-like flowers of a cockade form, deep velvety crimson in colour. It flowers well both in the plains and in the hills. In the hills it loses its leaf in the winter, but in the plains it does not; as it should have an artificial period of rest, water must be withheld by degrees.

TIGRIDIA.

Nat. Order Iridaceae.

These are plants with most gorgeous flowers and with but little foliage, on which account they are better planted in clumps in the border to hide their naked stems. The bulbs should be put down in October and require but little attention further than watering them moderately. If the soil is very stiff mix it with a sprinkling of sand. They look well in boxes or pots planted in clumps. Withhold water by degrees when they have done flowering and do not disturb the bulbs, but surface dress the box in which the bulbs are when they start into growth again the following season.

TULIPA.

Nat. Order Tulipaceae.

The Tulip cannot be cultivated in the plains with success. In hill stations the bulbs should be planted in open beds in October or November. When they send up their flower scape, a tube of paper must be put over to draw them up; otherwise the flowers may be quite close to the ground and lost to view. Watering with liquid manure when the flowers begin to appear, aids them considerably in this country.

Tulips like a good rich turfy loam of an open and porous nature. Their roots require protection from frost in the winter.

They are divided into three main classes. The first, Roses, have a white ground and crimson, pink, or scarlet markings. The second, Byblomens, have a white ground and purple, lilac or black markings. The third, Bizarres, have a yellow ground with any coloured markings that present themselves. There is another class known as the Self Tulip, with only one colour.

As there are innumerable varieties and colours to choose from, Tulips may be arranged most advantageously in beds, in geometrical figures in a colour design.

VALLOTA

Nat. Order Amaryllidaceae

These are shy in flowering on the plains but give no trouble on the hills. An occasional watering with liquid manure helps them and does good in dry weather. The bulbs should not be disturbed for years, they do all the better if the soil is only surface dressed.

ZEPHYRANTHES

Nat. Order Amaryllidaceae

A large number of this species are grown in this country, and deservedly so, as they are really pretty little bulbous plants, that grow with little care, in almost any soil, with little cultivation. They bear Crocus-like flowers, singly, on a longish stem.

They are best planted in a compost of loam, leaf mould and old cow-dung, either in beds or in pots. Not infrequently their flowers appear in profusion after a good shower of rain. It is best to leave the bulbs undisturbed for a year or two, when they will require transplanting, after being divided. In the hills they require protection with leaves or old manure during the winter.



DIMORPHICHA AFRANTICA HABITUS

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Chapter Six.

ORNAMENTAL AND HERBACEOUS PLANTS.

AECHMEA.

VERY handsome plants suitable only to the plains or warm conservatory culture in the hills. They are propagated by suckers or offsets which appear after the flowers have died down. These are taken off and planted singly in a light soil, when a moist heat easily roots them. Strip off some of the lower leaves before planting. The plants when rooted and large will require very large pots. The plants are epiphytal in their nature and do not require much water. When they are in flower water may be applied more freely. They require particularly good drainage and no water must be allowed to collect round the crown of the plant. *A. Calyculata*, flowers bright yellow and tubular with red bracts; *A. Cœlestis*, flowers sky blue; *A. Exudans*, orange; *A. Fasciata*, rosy pink; *A. Fulgens*, rich deep red; *A. Spectabilis*, rosy crimson; *A. Veitchii*, scarlet.

AGAVE.

These are ornamental plants, many of the varieties being useful for hedges. They are all propagated by division and seed. *A. Americana* is the most commonly used and there is a variegated variety of this. *A. Celsiana*

is a beautiful species with purplish brown flowers and *A. Densiflora* is another handsome species with yellowish red flowers

ALOE

Many of these plants deserve a place in the garden and some make pretty pot plants. They all enjoy a light soil, well drained, and endure extremes of temperature, but prefer heat to cold and drought to damp. They are propagated by division of the roots. *A. Intermedia* and *Saponaria* have the leaves dotted with white. Among those suitable for pot culture are 1. *Barbadense*, *Serrulata* and *llysinnica*

ALOYSIA

The sweet-scented *Verbena*, *A. Citriodora*, when properly grown in a rich and well watered soil of loam, mixed largely with leaf mould, is a charming plant. The flowers are very insignificant. They grow to perfection in open beds, enriching the soil around the roots with a surface dressing two or three times a year and occasionally watering with liquid manure. They are best renewed annually by cuttings put in sand under glass in October in the plains, and in April or May in hill stations.

APLUDA

A. Aristata is a plant with foliage much resembling the bamboo. It grows to about two feet in height and is pretty planted in a pot of any ordinary soil manured with leaf mould and well drained. Planted in the border it spreads quickly. Repays cultivation.

AQUILEGIA

The Columbine, *A. Vulgaris*, is a pretty plant and does well up-country and in hill stations. The seeds may

be sown in the plains in October and in the hills in October and again in April. Any good garden soil suits it and it flowers well the second season. It requires a little shading during the hot weather. *A. Cœrulea* is large flowered, having the centre petals sulphur yellow and the spurs and sepals pale blue; *A. Californica* is yellow and orange red.

ARMERIA.

These plants are useful for edging borders, rockeries and pot culture in the hills; they do not do well in the plains. They are propagated by seed or by division. *A. Cephalotes* is deep rose; *A. Dianthoides* is light pink and *A. Juncea* is pink.

ARUNDO.

A. Versicolor is a pretty grass and exceedingly ornamental. The leaves are green striped with white and will grow without care in any garden soil. Propagated by division of the roots which spread very rapidly and must be kept within bounds.

AURICULA.

A flower of great beauty in colours which are extremely brilliant and rich. It can only be cultivated in the hills. It delights in shade but cannot bear damp. The seeds may be sown in October or March, in pans, and when the plants are strong enough, they should be transplanted singly in small pots, or in threes in large pots. They are best planted singly. The drainage should fill one-third of the pot and the compost should be added to form a cone on which the roots are spread and then filled up, leaving the collar of the plant just higher than the edge of the pot. The compost should be light and rich, consisting of loam two parts and one part of well-decayed cow-dung with a little sand added.

AZALEA

The finest for conservatory decoration are the Chinese and Indian varieties. They are made bushy by pinching off the tips of the shoots three or four times a year. They are essentially hill plants and growth may be induced by the use of forcing pits and their blooms enjoyed during the greater part of the year. Their treatment in this country corresponds to that of the Camellia.

BAMBOO

The bamboo is delightfully ornamental in the garden and the various varieties can be put to a number of different uses. *Bambusa nana* is a small ornamental species and is suitable for hedges. *B. Striata* is a very ornamental variety with yellow stems striped green. *Dendrocalamus strictus* is the male bamboo with solid stems. *Phyllostachys nigra* is a species with blackish purple stems.

BOUVARDIA

These do well in the hills and are very handsome plants, bearing splendid heads of flowers. For green house cultivation in the hills there are few plants to compare with them in value. They enjoy a rich soil and in the warm months require a moist atmosphere and lots of water and shade from bright sunshine. *B. Augustifolia* has pale red flowers, *Flava* is yellow in drooping racemes, *Jasminiflora* is white and fragrant, *Leiantha* is scarlet and *Alfred Neuner* is double white tinged with rose.

CALCEOLARIA

These are most beautiful plants which are remarkable for their large spotted flowers. They are exclusively conservatory plants in India. Cuttings should be taken in October and placed under a hand glass in sand. In early Spring they should be transplanted singly into pots and

to form bushy plants they should be repeatedly pinched. They can also be grown very satisfactorily from seed sown in October or March in the hills and they germinate best without heat. The pots should be well drained and the compost composed of sand, leaf mould and loam in equal quantities. The young seedlings should not be allowed to get dry and the atmosphere should be kept moist. They should never be over-watered and care must be taken not to expose them to frosty weather.

CAMPANULA.

There are a great many varieties grown chiefly as pot plants. Though they do well in the plains they are best suited to the hills. In the plains they are difficult to keep through the rains. In the hills the seed may be sown in October and in the hills there are two periods; one in March and April and again in September and October, in a little bottom heat. When strong enough they should be potted separately. They like a rich sandy soil. *C. Carpatica* has blue flowers; *C. Carpatica alba* is white; and *C. Media calycanthema* is the cup and saucer flower, there is a blue variety and a white variety.

CARAGUATA.

These are pineapple-like plants and should be cultivated after the same manner as *Bilbergias* and require the protection of a grass conservatory in the plains. They are cultivated for their foliage and require, during the warm months, a copious supply of water. They are best grown in a compost made up of charcoal, leaf mould, a little pounded mortar and sand. It is difficult to cultivate in the plains but does well in the hills in a warm conservatory.

CENTROPOGON.

Handsome pot plants bearing tubular flowers during the winter months in the hills. They are useful to grow

in baskets suspended from the roof, where they are seen to best advantage. They are easily propagated by cuttings placed in sand and afterwards grow well in leaf mould, sand and a little garden soil. They require lots of water, especially during the growing season, and should be watered very sparingly during the winter. *C. Fastuosus* has rose-coloured flowers and *C. Lucyanus* is rosy carmine. *C. Cordifolius* is a stove variety with rose-coloured flowers, and may succeed in the plains.

CHORIZEMA

Propagated from seed, these form pretty plants trained on a trellis or grown in bush form. They are best suited to the hills where they should be grown under glass and protected from the rain. They require firm potting in a sandy loam and are best propagated from seed. *C. Augustifolium* has orange red flowers, *C. Cordatum* is red or yellow and *C. Henchmannii* is scarlet.

CLIANTHUS

The Parrot's Beak or Glory Pea, *C. Puniceus*, has pendulous flowers like a pea, about two inches long and of a scarlet colour. It flowers abundantly in a dry climate. *C. Magnificus* is scarlet. *C. Dampieri* is bright scarlet with a black spot in the centre. The seedlings of this variety should be grafted on seedlings of *Colutea arborescens*, sowing the latter seed about a month before the former. *Clianthus* seed should be sown in the plains in October and in the hills early in Spring and they will flower the same year. They may also be raised from cuttings. Does not transplant well. Loam, manure and charcoal make an excellent compost for a pot. Water should not be allowed to touch the collar of the plant. By piling the soil high in the centre, water can be given round the margin. Is adapted for hot, dry and sunny

situations. It is grown in India successfully as an annual.

CRASSULA.

Rather pretty fleshy plants which may be propagated by cuttings first allowed to dry a little after cutting. They are very ornamental with a grotesque appearance and thrive well in the hills in a mixture of sandy loam and brick rubbish in well-drained pots. *C. Arborescens* has panicles of rose-coloured flowers; *C. Ciliata* is cream; *Coccinea* is scarlet; *Jasminea* is white and *Versicolor* is white with a red margin and sweetly scented.

CURCULIGO.

These are most ornamental plants with palm-like growth. Their cultivation is easy but they are all the better for the shade of a grass conservatory and a light, well-drained sandy loam. They are propagated by suckers which form at the base of the stem. *C. Recurvata striata* has leaves marked with a distinct band of white at the back and white petioles and *C. Recurvata variegata* has plaited and recurved leaves beautifully striped white.

CURMERIA.

C. Picturata bears very handsome dark green leaves with a broad silvery band down the centre. *C. Wallisii* is a stemless plant with large leaves mottled pale yellowish green, turning later to a grey colour. In the hills they require a glass conservatory and in the plains a grass one.

CYANOPHYLLUM.

Very beautiful foliage plants that require to be grown in a grass conservatory in the plains. Propagated by cuttings put down in sand under a hand glass. They require a well-drained, light sandy compost and should be grown in the hills in a glass house. *C. Magnificum* has long broad leaves velvety green above with ivory

white rib veins and the underside reddish purple *C Spectandum* has smaller leaves with the mid-rib metallic grey, tinged red

DICENTRA

Very pretty little plants for pot culture in the hills. When put down in November in pots in a sheltered position, they succeed fairly well up-country. The plants, after they have flowered, should be allowed to die down in the Autumn and should be started again in the Spring. The roots which are fleshy should not be allowed to go dust dry. *D Spectabilis* is a pretty species bearing pretty heart-shaped flowers of a rosy crimson colour, *D Thalictrifolia* has fragrant yellow flowers with a reddish mouth, *D Eximia* has drooping bright reddish purple flowers and *D Formosa* has bright red flowers.

DORYANTHES

Much like an Aloe but with narrower leaves, out of which it sends up a straight flowering stem, often twelve to twenty feet high, at the summit of which is a tuft of flowers. They are very handsome plants and suited to a grass conservatory. *D Excelsa* has large brilliant scarlet flowers and *D Palmeri* has red flowers with a white centre. They are propagated by suckers but take a long time to come into flower.

ENCEPHALARTOS

Very handsome plants allied to the Cycas and is propagated by seed. Water copiously when in growth, and syringe, but when not making new growth little water is necessary. The best compost for them is a strong loamy soil with the addition of a little sand.

EPACRIS

These plants resembling Heaths bear very handsome flowers and thrive in hill localities. They grow best in an

old loamy soil mixed with sand and charcoal, coarsely pounded, and old cow-dung. Although the plants require lots of water, the pots must be well drained, and given plenty of air and light and protection from frost. They should be well cut back after flowering, and when they have grown a little they should be re-potted and placed in a cold frame. After a few weeks they should be exposed, and if their wood is hardened by September, they may be placed in the conservatory or the verandah, where they will yield an immense profusion of splendid blooms. The waxy tube-like flowers are of most beautiful colours, some exceedingly brilliant and others of a more delicate colour. They are propagated by cuttings.

ERICA.

These are valuable for conservatory purposes as the different varieties flower at different seasons. They have been propagated by seed and have flowered in this country in the plains. They are propagated by cuttings, an inch or two long, made of the young top shoots of the plants: these should be put in sand under glass so as to completely exclude air, only taking off the glass to wipe off the moisture. They must be occasionally transplanted, care being taken to well press down the soil around the roots.

EUPHORBIA.

These plants grow best in brick rubbish, leaf mould and charcoal with an addition of sand. Some of them are most charming plants and are all propagated by cuttings placed in sand in the shade. *E. Fulgens* is one of the finest pot plants there are. When in flower, in the cold season, it is covered with vermilion-coloured flowers along the stems. Some time before flowering, the stems should be tied down round the pot, which will induce new shoots to spring up covered with blossoms. Other ornamental varieties are *Bojeri*, *Splendens*, and *Regis jubæ*.

FILTONIA

These are trailing plants with ornamental foliage, suited to shady positions where they thrive with little care in almost any soil and propagate themselves rapidly. They are suited to rockeries and may be employed to fill hanging baskets. A little mortar in the soil suits them, particularly during the rains when the leaves are at their best. Lumps of it should be put in the soil as well as on it.

FUCHSIA

These are propagated both by seed and by cuttings. The latter should be put down in pots of leaf mould and sand in September, from the strongest tops of plants as nearly out of bloom as possible. The cuttings should be about two inches long. Press the soil well down about the cuttings and place them in a situation where the heat will be about 60 degrees. In the hills they grow out of doors and grow from cuttings put down in the rains quite readily. They will be all the better for being under a bell-glass. In about three or four weeks they will be fit to re-pot singly into three-inch pots, only allowing the strongest shoot to grow. They should be re-potted when the roots reach the sides of the pot until they are in large pots suitable for flowering. They will require supports. After they have grown about a foot the top shoot should be headed in to induce side shoots. The fresh leading shoots should be stopped so as to induce a pyramid form. A regular temperature of not over 60 degrees should be maintained throughout. They should not be allowed to seed. Liquid manure is better than putting manure into the soil. They should be shaded from the hot sun and at least a month previous to their blooming the pinching must be stopped. Shade helps them to develop their flowers. The plants should be cut back after blooming and put by. When they begin to spring again, take a few inches of soil off the surface and replace it with fresh

compost, and as they grow re-pot into larger pots. These will form splendid plants the second season for early blooming.

F. Alice Hoffman, carmine sepals, pure white corolla.

F. Altair, coral red sepals, violet corolla.

F. Beauty of Cleveland, fine double white.

F. Buffon, scarlet sepals, blush white corolla, double.

F. Dainty Lady, deep carmine red sepals, semi-double, white corolla.

F. Earl of Beaconsfield, deep orange.

F. Fascination, white sepals, pale rose pink corolla.

F. Julius, bright red sepals, rosy lavender corolla.

F. Lena, white sepals, deep mauve corolla.

F. Mrs. Rundell, orange, drooping habit.

F. Phenomenal, red sepals, purple corolla, enormous double.

F. Rose Phenomenal, rosy mauve, double.

F. White Phenomenal, pure white, double.

FUNKIA.

Very handsome small pot plants bearing drooping, bell-formed, fragrant flowers. Propagated by division of the roots, which should be as little disturbed as possible, or the plants will not bloom. The compost should be light enriched chiefly with leaf mould and well drained. In hill stations, at high elevations, the leaves die off in Winter, but the plants should not be interfered with. In Spring the pots should only be surface dressed. The roots should only be divided when necessary.

GENTIANA

These are all exceedingly pretty flowering plants which, in cool climates, require no particular care, but will not succeed at all in the plains of India. They do well for edging and require a light rich soil. Propagated by seed and, except in the case of *G. lecaulis*, a lovely species with large blue flowers marked with yellow, seldom by division of the roots. *G. Alida* is milk white with blue dots and *G. Kurroo* is a lovely intense blue.

GYNERIUM

The Pampas grass is a handsome and noble looking plant and bears a huge dense silky panicle of flower, attaining a height of from six to ten feet. Propagated by seed or division during the rains.

HELIOTROPIMUM

The Heliotrope is a most delightful flowering shrub with a lovely fragrance. It requires a light sandy soil manured largely with leaf mould and is greatly benefited by applications of liquid manure made from cow-dung given to plants just about to flower and in flower. Propagated from seed and cuttings. The former should be sown in October in the plains and in April in the hills. The Heliotrope must be grown in the open, exposed to full sun, any shade is detrimental to flowering. Water-logging is its greatest enemy in the plains, and should be grown at least eighteen inches above the level of the ground. It may be planted on top of a mound made up of garden soil, leaf mould and broken bricks. The plant will rapidly throw out branches on all sides and these should be pinned down for new plants. A rather pretty method is to grow a pot plant into a standard. The undermost leaves and buds should be nipped off as soon as they appear and the plants allowed to run up with a clean stem to about four feet in height and then allowed to form

a head. It will require staking. It can also be grown on to a trellis work of bamboo. There are many much improved varieties which yield immense heads of flowers. *Beauty of the Boudoir* is dark purple with a white centre; *Jeanne d'Amour* is very dark purple; *Swanley Giant* has very fine massive heads of deep blue flowers and *White Lady* is the nearest approach to white.

HYDRANGEA.

These are really marsh plants and require plenty of water, and though in the plains they are only fit for pots, in cooler localities they grow into large shrubs. They should be grown in a rich soil composed of sand and a large proportion of leaf mould and loam, with some cow-dung. They are propagated by division. The colour is heightened by watering with alum and soap-suds, and the colour of any variety generally varies according to the nature of the soil.

KERRIA.

K. Japonica does very well in the hills in almost any soil and is about the first to flower in Spring. The flowers are like deep orange double roses with many petals. The single flowered variety is in bloom all the year round and the double only flowers in Spring. Propagated by cuttings and division of the roots.

LEEA.

L. Coccinea is a plant which is exceedingly pretty in the rains with crimson flowers and berries. It may be propagated from seeds or cuttings. *L. Amabilis* is a very different plant with pretty bronzy green foliage with a broad white stripe down the centre. The reverse of the leaf is claret-red with a green stripe down the centre.

LIATRIS

These are biennials and will only do well in the hills. The seed should be sown in October and held over to the following season to flower. They are very pretty, with fine grass-like leaves and flowers produced on a spike about three feet high. They do well in pots in almost any soil.

LISIANTHUS

This is a lovely plant bearing in great profusion trumpet-shaped, rich purple flowers. They are only suited to the hills and are rather difficult to cultivate. The seed should be sown in October and kept over till the next year for flowering.

LOTUS

These are pretty plants and are suitable for beds, rock work or dry banks. They remain in flower almost all the year round, but bear their flowers in greater profusion during the cold months. They are in their perfection during the second year of their growth. The seeds may be sown in October in the plains and April in hill stations. They may also be propagated by cuttings, but it is better and easier to propagate by seed. *L. Corniculatus multiflorus* is of a trailing habit and suitable for hanging baskets, *L. Australis* has pretty spikes of beautiful rose-coloured flowers, *L. Jacobæus* has brown chocolate-coloured flowers and *L. J. Luteus* has yellow flowers.

MACKAYA

M. Bella is a lovely plant and flowers fairly well in conservatories in India. It requires a gravelly soil mixed with leaf mould and sand. Its flowers are from four to six inches long, pale lilac, the throat pencilled with darker lilac markings, and produced in racemes of many flowers. In Summer, growth should be encouraged and in Winter rest is necessary. Propagated by cuttings taken during the rains.

MYOSOTIS.

The seeds of the Forget-me-not should be sown in October and November in pots, and being a semi-aquatic plant, must be well watered, but not from the surface, when sown. The pots should be placed in pans of water. In the plains they should be treated as annuals. In the hills the seed should be sown in October and kept over the Winter to flower in Spring.

NAEGELIA.

These are plants with lovely leaves and flowers. They thrive in hill stations with the same treatment as Gloxinias and succeed fairly well in the plains in a grass conservatory. They are propagated by division of the roots, by cuttings, and by leaves pegged down on sandy soil. *N. Abomey* is large whitish rose with variegated brown leaves; *N. Archimandrite* is a soft lilac crimson with a yellow throat, spotted crimson; *N. Clifton* is flaked carmine with a golden and vermilion tube; *N. Columbine* is citron yellow and *N. Itambe* is deep vermilion round a yellow blotch. There are many other beautifully coloured varieties.

NANDINA.

The Sacred Bamboo of China, *N. Domestica*, is a dwarf ornamental shrub bearing panicles of red berries. It has a fine feathery appearance and makes a lovely pot plant. Propagated by division of the roots.

NIDULARIUM.

These are pineapple-like plants with long and recurved leaves and bearing flowers in dense terminal heads. They are suitable for growing in grass conservatories. *N. Humilis* has crimson flowers; *N. Fulgens* is red and *N. Spectabilis* has flowers of a white, blood red and pale violet colour.

PANICUM

These are rather pretty grasses of which probably *P. Variegatum* is the best. The blades are white striped and pink tinted and have waved margins.

PENTSTEMON

These are herbaceous perennial plants and can be raised from seed sown in October in the plains and also in the hills in Spring. They can also be propagated by cuttings and division. They flower during the hot and rainy seasons and bear pretty flowers of tubular form chiefly scarlet, purple and blue in colour. They do well in the hills and flower well if planted in open beds. *P. Grandiflorus* has large handsome lilac flowers, *Lobbi* is yellow, *Murravanum* is scarlet, *Ozatum album* is white; *Cobæa* is blue and yellow, *Acuminatus* is bluish purple, and *Laffrayanus* is a very handsome variety with large bright blue flowers.

PEREROMIA

Low growing, perennial, herbaceous, fleshy leaved, creeping plants with interesting ornamental leaves. They grow in almost any soil and soon ramble to a good distance in their growth, their stems being hidden by foliage. A light rich soil suits them best and they are propagated by division.

PITCAIRNIA

These plants have sedge-like leaves and bear very handsome flowers of a brilliant crimson colour, which are produced during the hot and rainy seasons. They should be grown in a light sandy soil mixed with drainage materials and cocoanut fibre. They are propagated by division and should not be heavily watered.

PRIMULA.

These are lovely plants and are extremely useful for decoration. The seed must be sown very thinly and carefully watered, using a compost of sand and sifted leaf mould. They enjoy a shady situation and if generously treated will amply repay with a profusion of splendid bloom. As they grow they may be shifted to larger pots. Over-watering makes the soil sodden. In the hills sow in April and in the plains in October.

RAVENALA.

The Traveller's Tree, *R. Madagascariensis*, resembles a plantain in appearance and grows easily in almost any soil. It derives its name from the water which collects in the sheaths of the leaves. It is propagated by division.

REINWARDTIA.

These are most ornamental plants which grow in the open border and are propagated by division. They grow to about two and a half feet and flower in great profusion. *R. Trigynum* has orange yellow flowers and *R. Tetragynum* has pale yellow flowers. They both flower during the cold season.

RHODEA.

R. Japonica is much like an Arad bearing panicles of white flowers followed by berries. There is a variegated variety with golden variegations in the leaves. Propagated by seed in the rains, and as they require a certain degree of shade and moisture, they are best grown in a grass conservatory. They like a well drained, light and sandy soil.

SANCHEZIA.

Noble large leaved plants which are very handsome. They are propagated by cuttings and thrive in a rich

sandy soil in a somewhat shady situation *S Longiflora* has rich vinous purple tubular flowers, *S Nobilis* has yellow flowers with bright red bracts and *Glaucophylla* is a very fine variety with shining green leaves striped with white and yellow

SAXAFRAGE

This is a large genus of plants quite unsuited for cultivation in the plains In the hills they do well and are lovely for the rockery They grow with little care in almost any soil *S Granatum* bears white flowers in great quantity and *S Hosti* has greyish green leaves and pink flowers *S Oppositifolia* is a brilliant little plant with bright purple flowers, *Sarmantosa* has lovely leaves reddish below and green with white veins above, *Peltata* has pink flowers and requires a shady situation with a compost composed very largely of leaf mould, and *S Umbrosa*, London Pride, is a late flowerer with white flowers dotted pink

SENECIO

S Elegans is a pretty little plant of a bushy habit producing in its varieties flowers ranging from white to dark violet in colour In the plains they should be treated as annuals and sown in October In the hills they can be sown in April and cuttings taken in Autumn should be protected during the Winter

SERIOCOGRAPHIS

These grow well in grass conservatories and are really handsome shrubs *S Ghiesbreghtiana* bears scarlet flowers in terminal panicles It should be grown in a rich light soil, and is propagated by cuttings during the rains

TACSONIA.

These plants do not succeed in the plains but are quite hardy in the hills where they will grow in almost any good soil, with little care, and are cultivated in the same manner as Passion Flowers. *T. Insignis* has large violet crimson flowers with the petals of a darker crimson than the other parts of the flower and a mottled blue corona; *T. Manicata* is vivid scarlet; *T. Mollissima* is pink flowered and *T. Van Volxemii* is a showy scarlet variety.

TETRANEMA.

The Mexican Foxglove, *T. Mexicana*, is a pretty little pot plant which flowers almost all the year round, with primrose-shaped flowers which are of a purplish violet colour and borne in umbels. It thrives in a light soil enriched with leaf mould and well drained. The plants are delicate and should not be exposed to sun, wind or rain. They are propagated from seed which take a long time to germinate.

TILLANDSIA.

These are rock-loving plants remarkable for their leaves which are of various colours. Tied to a block of wood with moss they grow very well. They may also be cultivated in pots in the same manner as *Bilbergias*. They are, however, mostly epiphytal in habit, many of them being found in their native habitat on trees.

TREVESIA.

These are handsome foliage plants, easily cultivated in a compost of sand, loam and leaf mould. Propagated by cuttings put down in sand. They do well in a grass conservatory.

TYDEA

These choice plants have both lovely flowers and leaves and are best grown in a plant house where they will be seen to perfection in flower and foliage. They require the same cultivation as *Gesnera*. These are some of the hybrid varieties of this genus. *Amabilis*, flowers very hairy, dark rose, *Nicole*, flowers large, carmine, with the limb spotted brownish black on a white ground, *Niger* is carmine with the tube partly carmine and spotted maroon on a white ground, *Noe*, carmine limb striped and spotted purple on a magenta ground, and *Norbert* very large flower, cochineal above and yellow on lower part, limb lined and spotted ochre red on cream ground.

VIOLA

The Violet, *V. Odorata*, is generally propagated by division of the roots. They should be planted in a rich loamy compost in a shady situation, and do well in well-drained pots or boxes. They also do well on a rockery in a sheltered place. During the rains they are liable to suffer, unless put under the shelter of a shed or verandah. After the rains are over they should be turned out of their pots, their roots freed of all soil and carefully divided and planted out in fresh rich compost. Violets are very liable to insect attacks in the leaves and the plants should frequently be syringed with a very weak solution of salt water. There are many varieties, some white and others violet coloured, while others have double flowers.

VIBURNUM

These are not suited to the plains of India, but in the hills they grow with little care in almost any soil in good moisture and with shade, and are really lovely plants, with flowers somewhat like a *Hydrangea*, in globose heads.

YUCCA.

Y. Alifolia, *Gloriosa* and *Stricta* are much the same in general appearance, but *Gloriosa* is very much larger than *Alifolia*, and *Stricta* is much smaller and seemingly unsuited to the climate. *Alifolia* bears a large spike with many branches of fine egg formed pure white flowers in immense numbers in the rains, and is very handsome at any time, but more so when in flower. The flowering is induced by the removal of the lower leaves. It grows in almost any soil and is propagated by offsets. *Y. Gloriosa* is a branching species with tufts of leaves on each branch surmounted by its flowers.

THE ORNAMENTAL GARDEN.

PART II.

Chapter Seven.

PLANTS WITH ORNAMENTAL FOLIAGE.

MOST of these plants are of easy cultivation and make a great show in the conservatory or other shady parts of the garden. Some of them have pretty flowers as well, which are very effective against the coloured foliage.

ACALYPHA.

Nat. Order Euphorbiaceae.

Plants with fine ornamental foliage suitable for pot culture, for beds, for isolated specimens on lawns and for shrubberies. They are all highly ornamental and are of easy culture. Propagated from cuttings. The leaves are of an elongated heart-shape and beautifully marked with various colours : bronze, red, yellow and shades of green.

ALOCASIA.

A species of the Aroid family with lovely foliage, large and grand coloured. It enjoys a light soil with good drainage in the pots or tubs in which it is grown, and must also have a certain amount of shade, and as such is of great value in the conservatory. It is propagated by division of the roots.

ALTERNANTHERA

Nat Order Amaranthaceae

Small plants with pretty variegated and coloured leaves. They are mostly used for edging for which purpose they are very suitable. Easily propagated by cuttings in the rains, and also in October if well watered. In the hills they are not hardy.

AMORPHOPHALLUS

Nat Order Aroideae

Very curious plants allied to the Arum and are very effective in the conservatory. A compost of two thirds rich loam and well decayed manure suits them. They require lots of pot room and a temperature ranging from 55 to 70 degrees. In the winter they must be kept dry and warm, and damp has a very harmful effect. They are difficult to propagate and have a nasty smell, but are grown on account of their curiosity. The leaves are much divided and extremely large. The plants are natives of Sumatra, but there are several species which are natives of this country and are easily cultivated in a grass-conservatory.

ANANASSA

The variegated leaved Pineapples are handsome plants for the conservatory. They are easily propagated by division and do well in a light rich soil with an addition of sand.

ANTHURIUM

Nat Order Aroideae

Most noble and beautiful plants which are worth any extra care bestowed on them by way of cultivation. They are easily cultivated, if allowed a free and open soil and good-drainage. In treating those of the ornamental foliage section, it is very necessary to remove every flowering spathe that may appear, otherwise the size of the leaves

will be greatly diminished and may not attain even half their size. They should be grown in pots placed within other pots; the space between being filled with earth which should be kept moist; or the pots may be plunged into earth, which perhaps is better. Wooden tubs are very suitable for growing them in. The compost in which they are grown cannot be too rich and must be well drained.

Propagation is effected in two ways. The first is to remove the lower leaves of the plant with the leaf bud and one or two of the roots adhering to the back of it. The leaf stalk clasps a good way round the stem, so that the knife must be inserted considerably above the bud and brought out below it with a semi-circular cut, and the bud and leaf with the roots attached should at once be planted in ringpots, one in each pot, and covered with a bell glass. In about a month the bud will have thrown out leaves. The second method is to take the plant out of the pot, shake off the soil and cut off the tap root. The plant may then be re-potted and kept in a shady place. The tap root should be cut into pieces, each having an eye and a root attached to it. These should be put into small pots and covered with a bell glass.

There are two sections amongst the Anthuriums: the flowering and the ornamental foliaged.

ARUM.

Nat. Order Aroideae.

These plants are easily cultivated, and are propagated by division of the roots. The plants die down in the cold season, but by watering they come up again in March. Water should be withheld when they have done flowering to allow the bulbs to rest, and they should again be re-potted in the plains in October or November. Watering with liquid manure will be of immense benefit. They all do well in a very rich soil with lots of water supplied during the growing and flowering season. In the hills they

flower most profusely in Spring, and again in Autumn, after that they require little or no water in Winter

ASPARAGUS

Nat Order Liliaceae

There are several varieties of this plant, all very ornamental and extremely useful for decoration purposes. They are easily propagated by division of the roots, and grow best in a light rich soil with good drainage, either in pots or in the ground in a shaded position. In transplanting great care should be taken not to injure the fleshy roots. They do well in the hills and are also propagated from seed. 4 *Plumosus nanus* is a lovely plant suitable for pots

ASPIDISTRA

Foliage plants with prettily marked green and white leaves. The flowers which are produced close to the ground are insignificant. They should be grown in a soil richly manured with leaf mould and given plenty of moisture. Propagated by suckers. In the hills they should be grown in a glass house or under a glazed verandah.

AUCUBA

Nat Order Cornaceae

There are several varieties with various variegations of great beauty and succeed well in a light rich soil with occasional doses of liquid manure. They do well in the hills and should be sheltered from the monsoons. Propagated by cuttings and layering.

ARALIA

Nat Order Araliaceae

This genus of plants thrive well in our gardens, and are both trees as well as shrubs, the latter comprising some very ornamental plants with a great diversity of foliage,

very handsome in character. They grow very well in almost any well-drained soil, and in any position, but do better in the shade. Propagated by cuttings.

BILLBERGIA.

Nat. Order Bromeliaceae.

Plants with leaves similar to pineapples and require a light rich soil. They are good plants for shaded situations. They do best in heat, though when once growing stand a cooler atmosphere. Propagated from suckers in a shaded situation.

CALADIUM.

Nat. Order Aroidaceae.

These plants are easily grown and propagated; they multiply immensely. Being gorgeously coloured, they are great favourites, notwithstanding their leaves dying down during the cold season.

They are easily grown in pots with a free drainage in a light rich soil. They are propagated by division at the roots; even one bulb can be increased by dividing it with a knife, leaving some roots and an eye in each division. These when planted must be watered very sparingly, otherwise they are liable to rot off.

They enjoy a moist atmosphere and colour to perfection in a shaded position. They thrive best in a grass house or a shaded verandah and when once growing liquid manure improves the colour of the leaves greatly. In the selection of these plants, those varieties should be chosen with the stoutest footstalks and erect habit of growth.

CALATHEA.

Nat. Order Scitamineae.

These plants only differ from Marantas in some botanical characteristics, and hence are often confounded.

They delight in a good rich soil, open, well drained with some sand in it. They are easily increased by division and do well in India, where they are in their greatest beauty in grass conservatories.

CHAMACLAEDON

C. Rubens A handsome Aroid with leaves of about four to six inches long, two to three inches broad, dotted over the upper surface with small scales and of a red colour beneath. Propagated by division and is grown in a mixture of loam, sand, leaf mould, crock and mortar in a shaded place.

CODIAEUM (The Croton)

In lower Bengal, where West winds are not prevalent, crotons grow readily in the open, but where these winds prevail they are better grown in large pots, placed in the shade in a sheltered position. If exposed to the sun the leaves do not attain the beauty they otherwise would.

They are propagated by cuttings put down in the rains, but handsome plants are obtained by gootee grafting. A ring of bark is removed from the selected branch and this is covered over with moss and kept moist, the operation being performed at the beginning of the monsoons. At the end of three or four weeks roots will force their way out of the moss. The branch can now be severed below the roots and potted off.

They are ideal plants for pot culture and respond to good cultivation in a rich soil, with occasional doses of liquid manure. They should be re-potted once a year, as they will be found to send out a perfect meshwork of rootlets, which fill the pots within a few months. The leaves should now and again be washed to free them of dust. They do not stand the climate of the hill stations.

COLEUS.

These plants make pretty beds by putting down cuttings; or the stems of old plants may be pegged down. They require to be renewed frequently or they grow straggly. They love a rich soil and plenty of sunlight. The best cuttings are from the end of a branch. Imported seed often produce new varieties. They make beautiful pot plants when well grown. The ends of the different branches should be pinched off while the plant is young and each new shoot should be tipped as well. This will make a pretty bushy plant in time. The application of liquid manure is of immense benefit. The new large leaved varieties are the handsomest.

In the hills they only outlive the Winter with difficulty, and must be kept under glass or in a warm conservatory at high elevations during the Winter months.

CYRTODEIRA.

These plants have exquisite leaves with beautiful markings, and grow well in our grass conservatories in the plains. They require to be grown in a good, light, rich, well-drained soil, with pieces of mortar interspersed, and do well in baskets or rockeries protected from the full blaze of the sun in both hills and plains, but they do not bear transplanting well.

DIEFFENBACHIA.

Nat. Order Aroidaceae.

An extensive genus among the most beautiful foliage plants there are. The climate of the plains of this country suits them well. They delight in a rich open soil, with a mixture of old cow-dung and sand, and well drained. Though they are hardy plants and are easily propagated, they require partial shade and are best grown in a grass

conservatory In the hills they do not succeed except under glass

They produce their leaves on a single stem like a *Dracæna*, and seldom, except in the case of very old plants, throw out branches When they attain age they become unsightly, owing to the bare stem giving them a scraggy appearance

In propagating the top should be cut off just below the first mature joint It will root freely if covered with a bell glass The pot with the remaining old stem may then be tilted and allowed to remain thus, till the plant has thrown out side shoots, which in their turn may be each taken off with a small portion of the old stem, planted in pots and kept covered with glass, when they will form fine young plants Another method of propagation is by gootee grafting

DRACAENA

Nat Order Asphodelaceae

This is a most picturesque family of plants, with their beautifully variegated leaves, tinted and striped white, yellow, red, pink, cream and green of several shades They are easily propagated, hardy and admirably adapted to the climate of this country

After a time the plants grow tall and leggy, at this stage the top of the plant can be removed by gooteeing and the remainder of the stem may then be cut into pieces of about three or four inches and treated as cuttings and covered with glass These will send out numerous young shoots, which, when three or four inches long, may be cut off, each with a small portion of the old wood and planted as cuttings again under glass The root of the *Dracæna*, which is long and tapering, is covered with buds, and may also be cut up into small bits and planted as cuttings under

- glass. These root more freely than stem cuttings, and although they make the stronger specimens, they take longer to exhibit their variegations.

They are eminently suited for pot culture and do well in a rich compost and benefit by applications of liquid manure. They are seen to best advantage when grown in a grass conservatory or in a sheltered verandah.

DRIMIA.

Nat. Order Liliaceae.

D. Revoluta is a pot plant the leaves of which are spotted with white. It bears small pink flowers on spikes. The compost for it should be of a light sandy nature and well drained.

HELICONIA.

Nat. Order Scitamineae.

Plants with plantain-like growth and habit of easy culture, benefited by a moist atmosphere and frequent syringing of the leaves. Propagated by division.

HIGGINSIA or HOFFMANIA.

Nat. Order Rubiaceae.

These are very handsome leaved plants, the genus comprising about 20 species. In the plains they do best in a grass conservatory; in the hills they must be grown under glass in the Winter, though they may be kept out of doors in the warm weather, planted in light soil with mortar in it.

LYCOPodium.

These are fern-like plants of great beauty, trailing over a considerable extent of ground, and when in a healthy condition have a bright metallic lustre about them, which

makes them most attractive objects. They are easily propagated from cuttings in sand during the rainy season, and are best planted afterwards in brick rubbish in a shady situation, either in pots or under a tree. For the decoration of rockeries in a conservatory they are most useful.

MARANTA

The varieties grown in gardens for the sake of their foliage are really lovely plants, with bright lustrous leaves with subdued yet rich colours intermixed, several having bars and stripes and others having crescents on the side of the mid-rib.

They vary in height and style of growth very much, some attaining four feet while others are not more than four inches with a bushy, dwarf and erect habit.

They are increased by division of the roots most easily at almost any season of the year, but the best time is about April, or a little before that, when they have just begun to shoot after their season of rest. They should then be turned out of their pots, the roots washed clean, and then divided with a sharp knife into as many divisions as they have crowns, which should each be placed in a separate pan with a light, porous, well-drained soil. Water sparingly until they start into growth.

During the season of rest water must be applied in very small quantities. Some of these plants die down altogether during the cold weather, while others are partially dormant.

MONSTERIA

Nat. Order Aroideae

Curious ornamental leaved plants. The foliage of *M. Deliciosa* is leathery and is much punctured and divided

It is a handsome plant and succeeds well in a grass conservatory. The flowers are white, succeeded by a succulent fruit with a luscious pineapple flavour. It should be planted in a rich soil and must be given some kind of support.

PANAX.

Nat. Order Araliaceae.

These plants are very much like Aralias and should be treated in the same manner.

POINSETTIA.

Nat. Order Euphorbiaceae.

P. Pulcherrima is a large shrub growing to eight or ten feet high, with elliptical green leaves. In the cold season its branches, which droop and are in the form of rod-shape, have, at their ends, insignificant flowers surrounded by rays of large elliptical crimson scarlet bracteal leaves of the most gorgeous appearance. It grows to perfection in Bengal, but further up-country it must be sheltered from the cold.

By pruning it assumes a more upright growth, which robs it of its graceful drooping habit. It strikes most readily from cuttings planted during the rains. There is also a double variety available.

SCHISMATOGLOTTIS.

Nat. Order Aroideae.

These are rhizmatous plants, the leaves springing from the rhizomes being somewhat long, heart-shaped and often marbled or spotted. They require a moist atmosphere and lots of water and shade. A rich sandy loam which incorporates a good deal of leaf mould with good drainage suits it. Propagated by division during the rains.

SELAGINELLA

These are a vast genus of mosses, over 300 species, and comprise the great ornaments of the conservatory. Many of them grow in pans of water, others do well on rockeries. Their cultivation is attended with no difficulty if grown in light soil well mixed with charcoal and potsherds. They are splendid for rockeries, soon covering them with a carpeting of lovely green. Planted at the beginning of the rains they give no trouble, and start well into growth very soon, resting in Winter and starting into growth again in the Spring. They do well both in the hills and the plains.

Chapter Eight.

AQUATIC PLANTS.

FLOWERING plants for water are of two kinds: Aquatic and Sub-Aquatic; the former growing in the water and the other at the edge of the water.

On the banks of running streams and in the water most interesting plants may be found. Marshes furnish vegetation in great and interesting variety and ornamental for the garden possessing an artificial or natural pond, tank or stream. In the absence of any such ornament, a small tank 20 feet square might easily be constructed. After digging out the tank plaster it all round with clay, a few inches in thickness. This will do for the banks. Then put boulders of stone round where the water's edge is to be and this will form a handsome basin. The water may be supplied from the nearest well. In and around this most beautiful plants may be grown. The following is a list of Aquatic plants flowering from May to August. They all may be grown from seed.

With red flowers, *Equisetum fluviatile*, *Hydrocolite vulgaris*, *Equisetum palustre*, *Butomus umbellatus*, *Hep-
puris vulgaris*, *Polygonum amphibium*, *Hydropeltis pur-
purea* and *Polygonum hydropiper*.

With white flowers, *Nasturtium officinale*, *Ranunculus aquatilis*, *Hydrocharis morsusrane*, *Phellandrium aquati-
cum*, *Alismedamas onium*, *A. natans*, *A. plantago*, *Calla
palustris*, *Nymphæ alba*, *Cerastium aquaticum* and *Poa
aquatica*.

With yellow flowers, *Ranunculus aquatilis*, *Iris pseudoacorns*, *Villarsia nymphaeoides*, *Nuphar advena*, *N. lutea* and *Potamogeton natans*

With blue flowers, *Veronica beccabunga*, *Myriophyllum spicatum*, *M. Verticillatum*, *Pontederia cordata*, *Veronica anagalis*, *Alisma ranunculoides* and *Lobelia dormanna*

With purple flowers, *Utricularia vulgaris*, *Trapa nutans* and *Sagittaria sagittifolia*

With brown flowers, *Potamogeton lucens*, *P. perfoliatum*, *Scirpus fluitans*, *S. lacustris* and *S. triquetter*

Sub-Aquatic plants for the edges of the water with red flowers, *Pinguicula vulgaris*, *Tenerium scordium*, *Memphanthis trifoliata*, *Malva sepustris*

With white flowers, *Pinguicula lusitanica*, *Oenanthe pencedanifolia*, *O. crocata*, *O. fistulosa*, *Littorella lacustris*, *Samolus naterandi*, *Schœnus albus*, *Galinur palustre*, *G. uliginosum*, *Pedicularis palustris*, *Rumex obtusifolius*, *Diplacus pelosus* and *Serimum palustre*

With yellow flowers, *Carex flava*, *Ranunculus flammula*, *R. repens*, *Senecio peludosus*, *Hypericum elodes*, *Hottonea palustris*, *Rumex maritimus*, *Acorus calamus*, *Myosotis palustris*, *Rumex palustris*, *Cineraria palustris*, *Senecio aquaticus* and *Sonchus palustris*

With blue flowers, *Scrophularia aquatica*, *Schœnus mariscus* and *Phormium tenax*

With brown flowers, *Carex dioica*, *C. caespitosa*, *C. digitata*, *Schœnus nigricans*, *Carex paludosa*, *C. riparia*, *Schœnus compressus*, *S. nigricans*, *Scirpus acicularis*, *S. palustris*, *S. maritimus* and *Rumex aquaticus*

With purple flowers, *Pedicularis sylvatica*, *Triglochin maritimum*, *Aster tripolium*

HYDROCERA.

H. Trifolia is a plant of aquatic habit which bears large white flowers, variegated with red and yellow. Grow in a *gumlah* half filled with puddled earth and keep quite wet till the seed germinates. Add water as the plant grows and always keep an inch or two of water over the soil of the *gumlah*. The flowers are produced continuously till the cold weather sets in. Self-sown plants will come up the following year if the soil in the *gumlahs* is watered.

NELUMBIUM.

The Water Bean, *N. Speciosum*, is a common plant in the tanks and lakes of India and bears pretty rose-coloured flowers, which are very large and double. It seeds abundantly and may be sown by enclosing the seeds in balls of clay which should be thrown into the water. *N. Luteum* is a yellow flowering variety.

NAYMPHAE.

The seeds of the Water Lily are sown by mixing them with clay in balls and throwing them into the water where they are to grow. There is a large variety of these obtainable in a great variety of colours. The English variety is generally classed under the name Nuphar, and is yellow. Some of the best are *N. Stellata*, blue with yellow centre and semi-double; *N. Sturtevantii*, rosy red; *N. Rubra*, brilliant red; *N. Odorata*, white; *N. Versicolour*, rose; *N. Alba*, double white sweet-scented flowers.

VICTORIA REGIA.

The Queen Victoria Water Lily flourishes in the tanks of Calcutta, also doing well in Upper India, and is undoubtedly the queen of all water lilies. The immense and noble leaves, four to six feet in diameter, generally float on the water, with turned up edges and prickles on

the lower side, which is purplish, the upper side being a bright green. The flowers are one foot or more in diameter, rose coloured and deeper towards the centre. The seeds to retain their vitality must be kept in a bottle of water. Sometimes they do not germinate for a very long period and have been known to lie dormant for nearly three years. The seeds should be planted in a pot and placed in a tub of water, in full sunlight, as soon as the seed is obtained. When the seedlings appear they should be pricked out and placed singly in pots, shifting gradually to larger pots as the plants increase in size, till large enough to plant out in the large tank they are to occupy permanently.



STOCK FLOWERS - IBERIS

Chapter Nine.

ANNUALS.

A PLANT which is raised from seed and which flowers and dies in a single season is called an annual. Such are the flowers that are most commonly grown in India and form a prominent feature of any garden.

The most important operation in the cultivation of the annual is that of sowing the seed. Failure in germination can, in nine cases out of ten, be traced to carelessness in performing this and its attendant operations. When only a small quantity of seed is to be sown it is preferable to sow in pots or boxes. This plan is not only more sure and economical but the seeds can be guarded against the ravages of ants. This method also ensures against the disastrous results of heavy rain. On the plains the first sowings of winter annuals are usually made at the tail end of the monsoons and any attempt at sowing out in the open at this period would result in the entire stock of seeds or seedlings being annihilated.

The soil in which the seed is to be sown must be thoroughly prepared and pulverized; equal quantities of leaf mould and good garden soil with a small addition of sand makes an ideal compost. The soil should be well watered a day or two before sowing so that it may be fine and moist to receive the seed.

Great care must be taken when sowing to distribute the seed evenly. Too thick sowing results in weakly

plants liable to fungoid disease should damp weather prevail. To obviate thick sowing it will be found a great help to mix some clean sand with all fine seed that is to be sown. After sowing, the seed must be covered with a sprinkling of soil according to the thickness of the seed. Many seed are so small and delicate that to cover them with much earth would cause them to lose their power of germination, others, such as nasturtiums and sweet peas, need to be sown at least an inch below the surface.

The seed boxes must be watered with a fine rose can morning and evening, and, if necessary, they should be shaded from the hot sun during the day time. It will be found that some kinds take longer to germinate than others and patience and constant careful attention is necessary for success. When the young seedlings have attained their third or fourth leaf they are ready for removal into their permanent beds and this must be done very carefully so as not to injure the young roots, and perhaps a blunt-pointed stick is as good as anything for the purpose.

There are certain varieties of annuals that will not stand transplanting and which must be sown right away in their permanent beds. Among this class is the *Convolvulus*, *Delphinium*, *Echscholtzia*, *Hollyhock*, *Mignonette*, *Nasturtium*, *Poppy*, *Schizanthus* and *Sweet Pea*. Their beds should be prepared with a pulverized surface and treated in the same manner as the seed boxes. Generally germination will be thicker than will be required and will need thinning out, but this operation must not be done all at once, but in two or three steps. Still with a little care some of this class can be successfully transplanted without the plant receiving the slightest check. *Nasturtiums*, *Hollyhocks* and *Sweet Peas* can be sown singly in three-inch pots and transplanted carefully without breaking the ball of soil, before they throw out roots from the bottom of the pots. This method will be found useful not only for obtaining early flowers but when it sometimes happens the monsoons

carry on right up to the period when it is time to sow these seeds.

On the plains annuals are divided into two classes; those sown in early October for Winter flowering and those sown in June for monsoon flowering. On the hills the usual time for sowing is in the Spring.

A very important point to be remembered is to obtain good seed from a reliable source; all labour and money spent in cultivation and manure is wasted, if seed of an inferior quality is used.

The following comprehensive list is a description of the more popular annuals now in cultivation:—

Abronia.—A small plant of creeping habit with succulent stems; flowers rose coloured; one variety has yellow flowers; resembles those of *Verbena*; best grown in pots.

Acroclinum.—Bears flowers of a dry nature resembling paper cut to the form of an artificial daisy; there are two colours, rose and white, both having yellow centres; the flowers when cut and kept dry with ornamental grass form a handsome ornament, and in this way last and retain their appearance for a long time; grow to a height of about 2½ feet; distance apart in beds 18 inches.

Ageratum.—There are many varieties differing from each other only in the colours of the flowers, which are white, red and various shades of blue; on the plains seed should be sown in August.

Althea.—The Hollyhock is very shy of transplanting and should be sown where intended to flower; on the plains sow in August and September; it requires a light soil heavily manured and grows to a height of from five to six feet; should be thinned out to three feet apart.

Alonsoa —Requires no particular treatment and will grow in any soil, does well grown as a single specimen

Alyssum —Free blooming with white Candytuft-like flowers, suitable for beds and edging, there is a dwarf variety known as Minimum

Amaranthus —Plants valued mostly for their ornamental foliage, which colour better when the soil used is not rich, on the plains sow in May and June and again in September and October, height two feet, distance apart in beds 18 inches

Antirrhinum —Most useful border plants, very effective when grown in bold masses, there are three distinct types, the tall, the intermediate and the dwarf, each having a variety of colours, height from 12 inches to 2 feet, distance apart in beds 9 inches to 18 inches

Arctotis —The beautiful Marguerite-like flowers are enhanced by the silvery foliage of the plant and close at night, flowers produced on long stalks useful for cutting, pure white with a lavender coloured disc, height two feet, distance apart 12 inches

Arnebia —Handsome plant bearing blossoms all along the branches of a bright yellow colour, blotched black, changing to coffee brown

Aster —A most effective annual when grown in masses, colours are of every shade, some tinted, some entire, petals quilled, semi-quilled and flat, forms expanded or compact, flat or globular, petals tinted and curled like a Japanese Chrysanthemum, showing great diversity, both of colour and form, flowers profusely, so much so that, in the dwarf varieties, the leaves are almost entirely hidden when they are in full bloom, requires a light rich

soil; application of liquid manure when the flower buds appear is beneficial; on the plains seed can be sown from August to September.

Balsam.—On the plains sow in June and continue sowing at intervals for a succession of bloom; frequent transplanting is beneficial; requires a rich soil and the application of liquid manure; height 18 inches; distance apart 15 inches.

Bartonia.—A showy little plant with brilliant yellow flowers which open when exposed to full sun; requires a rich soil and plenty of water.

Brachycome.—Free flowering and very pretty, and of a dwarf growth; covered when in bloom with flowers like *Cinerarias* in form; suited for small beds, edging, pot culture or baskets; called the Swan River Daisy; bears single blue or white flowers.

Browallia.—Very pretty blue flowers; suitable for edging.

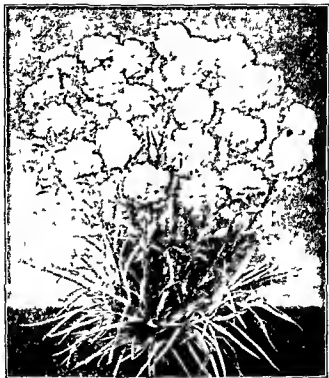
Calandrinia.—May last for some years in hill stations but must be treated as an annual in the plains; rich soil.

Calliopsis (Coreopsis).—An annual that can be grown all the year round and is splendid for cutting; height from two to three feet; distance apart 15 inches.

Calonyction.—The Moonflower is a tender sweet-scented creeper bearing white fragrant flowers. In the plains it may be sown in a permanent position, but in colder climates it is better to sow the seeds in pots and transplant into the border.

Candytuft.—Requires a rich soil; show off best when planted as a border to a contrasting colour; height 9 to 12 inches; distance apart 9 inches.

Carnation—On the plains sow in August and September, requires a rich soil and the application of liquid manure when the buds appear, suitable for pot culture, *Dianthus Caryophyllus* comprises those varieties called Cloves, Carnations and Picotees, most beautiful and fragrant flowers,



CARNATION

they do best in hill stations and are grown with difficulty in the plains, where they ordinarily do not flower the first year, and before they outlive another year die off, to flower the first year they must be sown early and grown on rapidly, the best compost for them when they are transplanted is two-thirds of decayed turf loam, one-third of old cow-dung and some sand, the Marguerite is a

type in various colours, and as it flowers the first year, is a distinct boon to the garden in the plains; the Picotee is merely a coloured form of the Carnation; there are white and yellow grounds and a true Picotee has merely a margin of colour; sometimes this colour, rose, red, purple or scarlet, is as fine as very thin wire and such flowers are termed "wire edged"; the colour may be as much as a quarter to an eighth of an inch wide, and are termed heavy or medium edged; the Clove Carnation has always been a favourite, but it is doubtful if the old clove of the early herbalists exists; the White Clove, or a white variety of Carnation, has been in existence; there are many very beautiful white Carnations, some of them sweetly scented, but none with the peculiar clove scent; the self-coloured varieties are generally very hardy and almost every colour is found among them; the "Fancy" Carnations have a white, yellow, buff, or apricot ground, flaked, striped and spotted of many colours; "Flakes" are carnations of two colours only with large stripes going quite through their petals; "Bizzarres" have their colours in variegated irregular spots and stripes; an exhibition carnation should not be less than two and a half inches in diameter; the lower petals should be six in number, broad, thick, smooth, laying over one another, and each row of petals a little smaller than that just under it and thus rising to form half a ball; all colours should be clearly and distinctly defined, and if there are two colours the contrast must be bold; the greatest care is used in preparing the flowers for exhibition; the calyx is tied round the middle to prevent its splitting down, as is frequently the case; this is done just when the bud is opening at the top, and then the five pieces which form the

outer leaves of the calyx are pulled back down to where it is tied and by this means the petals are properly developed, the petals are carefully "dressed" with tweezers, placing them in regular layers, and as the bud grows and expands, this artificial disposition of the petals gives quite a natural effect to the appearance of the flower, layering is the method to obtain plants of named varieties

Celosia —On the plains sow in late July and August, if sown at regular intervals a succession of bloom can be obtained, height 18 inches, requires a rich soil and plant 15 inches apart

Cineraria —Most delightful flowers succeeding better up-country than in Lower Bengal, requires a compost composed of equal parts of rich loam, leaf mould and old cow-dung mixed with a good quantity of sand and charcoal dust, should be grown in a conservatory and never exposed to the full rays of the sun, an important point in the cultivation is to grow them fast, cool atmosphere is most congenial and foliage should be constantly syringed, unable to stand a draught, in hill stations sow in March or in October in a sandy compost with good drainage, in the plains sow in August, liquid manure very beneficial during the flowering period, when pricking off seedlings from the boxes it will be noticed that the reverse side of the foliage is densely felted with short hairs, sometimes blue, sometimes crimson, sometimes white, and so on, this gives a useful indication of the colour of the flowers

Clintonia —The seeds are like dust and the compost should be rather sandy, pots should be placed in pans of water till they germinate, transplant into rich soil, the richer the soil the finer the blooms, requires pinching and regular watering, flowers

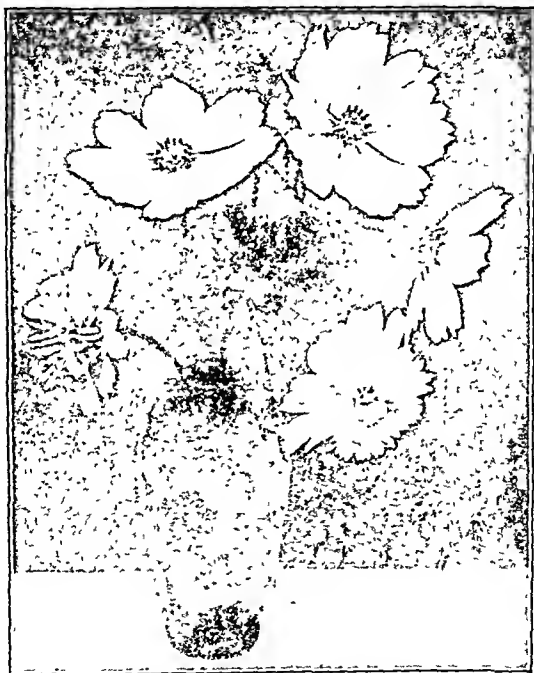
are blue, of dazzling beauty, and either yellow or white eyed; very pretty in baskets.

Collinsia.—Makes attractive beds and pretty ribbon borders; requires a light sandy soil enriched with manure.

Convolvulus.—Beautiful twining plants in a variety of shades and colours; does not like transplanting and wants a rich soil.

Cornflower.—Very useful, making a pretty vase decoration; height about two feet; plant 15 inches apart.

Cosmos.—On the plains can be sown from July right



SINGLE AND DOUBLE COSMEA.

on to January, but the earlier sowings give the best results; requires a well manured soil; height three to four feet; lovely for cut flowers.

Cuphea —Profusely blooming annuals succeeding in rich sandy loam, requires protection from frost

Daisy —Very useful plants for edging purposes, requires a rich soil

Delphinium —Does not succeed on the plains, seeds should be sown where the plants are intended to flower and only when the weather has got cold

Dianthus —A brilliant effect obtained when used as a border plant, also in beds, height 12 to 18 inches

Dimorphæteca —Star of the Veldt, makes a great show with its gorgeous orange flowers, flowers close at night, height 12 to 15 inches

Erysimum —Sow in the border or in pans, does not like transplanting very much, succeeds in a light rich soil

Eschscholtzia —Californian Poppy, does not like transplanting, soil light and sandy, height 18 inches

Futoca —Handsome flowers in many varieties, sow in the border where they are to remain, likes a rich soil and frequent watering

Gaillardia —Most useful for cut flowers, flowers all the year round, any kind of soil and can be sown at any time of the year, height 12 to 18 inches

Gaura —Should be treated as an annual, but may be kept over from year to year, requires shelter from frost in cold localities, delights in a rich soil and wants frequent watering, best sown in borders

Gomphrena —Bachelor's Button, an everlasting, invaluable as a Winter decoration in cold climates, in the plains sow in June and July in the open border or in pots, transplant, may be sown at any time in hill localities before the Winter sets in

Godetia.—Evening Primrose; good for cutting; height 18 inches.

Gypsophila.—Very useful for table decoration; requires a rich soil; height 12 to 15 inches; may be mixed with *Antirrhinums* to make a pleasing display; there is a rose-flowered variety but not so effective.

Hedysarum.—French Honeysuckle; dark foliage and dull red flowers; light soil.

Helichrysum.—Everlasting; should be sown in pans and transplanted into pots or borders; height 1½ to 2½ feet.

Hunnemannia.—Resembles the Californian Poppy and flowering better than it in some localities; should be treated in the same way.

Kaulfussia.—Sow in pots and transplant into beds or borders; rich soil.

Larkspur.—Seed should be sown in late October or November on the plains as germination will not take place till the nights get really cold; does not like transplanting; useful for cutting; height two to three feet.

Lavatera.—Rosy pink flowers; requires rich soil; height two feet.

Leptosiphon.—Charming plants with many small button-like flowers in clusters and foliage in dense feathery tufts; flowers purplish rose and white.

Linaria.—Toad flax; very effective, resembling miniature *Antirrhinums*; height 12 to 18 inches; requires a rich soil.

Linum.—Flax; does not like transplanting; very effective in a mass; height three feet.

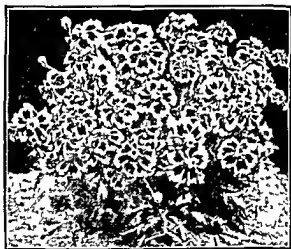
Lobelia.—In hill stations sow in October and in the Spring; careful sowing in pans is necessary as the

seed is like dust, place the seed pans in vessels of water to avoid overhead watering, transplant frequently into rich soil, make beautiful basket plants

Lousa—A creeper whose leaves sting like nettles when touched, sow in large pots or in the open border, requires support

Lupin—Does not like transplanting, likes a poor, rather sandy soil, height 18 inches to 2 feet

Marigold—Sow in June and July, September and



LEGION OF HONOUR, FRENCH MARIGOLD

October, is in flower most of the year, height 2 to 3 feet, should be transplanted to 2½ feet apart

Malcomia—Virginian Stock, should be sown where they are to remain, requires a light rich soil, height 6 to 9 inches

Malope—Should be sown where they are to remain, height 1½ to 2 feet, requires a light sandy soil

Mimulus.—The Monkey flower; requires a sandy soil mixed with leaf mould; transplant into pots and hanging baskets in well drained soil; in hill stations seed should be sown in Spring and make good bedding plants for Summer blooming; height 12 inches.

Mignonette.—On the plains can be sown from September to October; does not stand transplanting; grows to a height of 15 inches; requires a rich soil; applications of liquid manure beneficial.

Nasturtium.—There are two varieties, the dwarf and the climbing; the former class is very effective in



NASTURTIIUM.

ribbon borders, does not bear transplanting, sow each seed about four to six inches apart, rich soil induces too luxuriant foliage at cost of flowers, climbing kinds are exquisite and may be grown up a trellis to form a screen

Nemophila —Exquisitely pretty plants useful for edging, seed should not be sown until the cold weather has fairly set in, does not like transplanting

Nierembergia —Trailing plants suitable for baskets, two varieties, one with dark crimson flowers and the other with white flowers which are pencilled with lilac or purple, sow when the cold weather has fairly set in

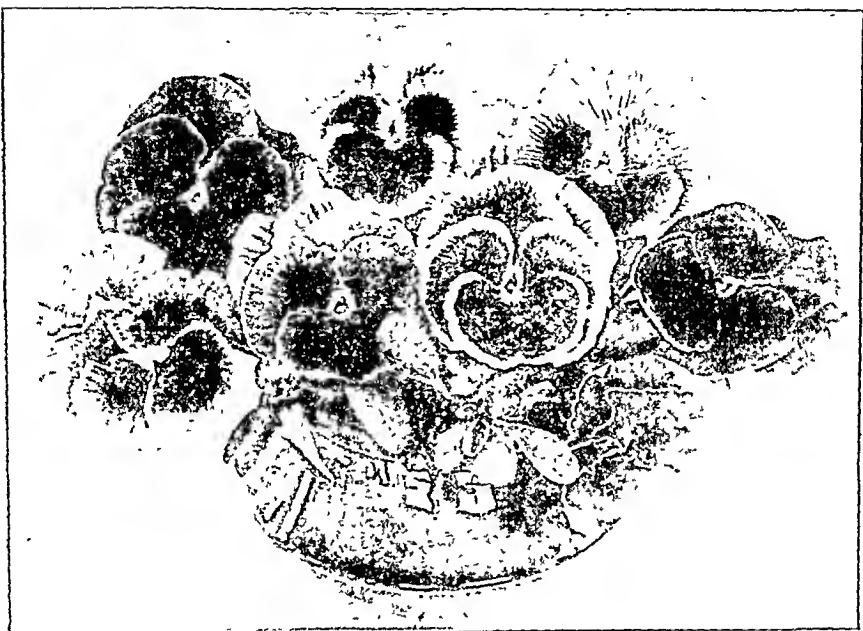
Nigella —Devil in a Bush, of easy cultivation in any good soil, makes a pretty effect in beds

Nolana —Suitable for hanging baskets, does not stand transplanting

Obeliscaria —Bears rich brown crimson flowers, edged golden, height 18 inches, suitable for mixed borders, delights in a sandy soil but rich

Oenothera —The Evening Primrose, useful plants for beds, borders, edging or rockwork, the perennial varieties should be treated as annuals in the plains and if sown early will flower the first year

Pansy.—Useful for edging and for carpet bedding; should be transplanted three or four times before being put out in their permanent quarters; the flowers are larger if the plants are not allowed to



SUTTON'S PERFECTION PANSY.

grow too bushy; transplant to six inches apart; requires good rich soil.

Perilla.—Grown for its ornamental foliage and useful for ribbon borders and edging; in the plains can also be sown in February and March.

Petunia.—On the plains can be sown at intervals from August to October; grows to a height of about 18 inches; flowers better towards the end of the Winter season; transplant to 15 inches apart; the brilliancy of these flowers, their duration, their

great beauty and their capability of withstanding variations of climate, commend them to special attention, succeed well in a light rich soil, in hill stations sow in February, March and April to flower in Autumn, or the following Spring, according to elevation, or in October to flower in Spring, they should not be allowed to remain in the seed beds too long, plant out as soon as the seedlings are strong enough to handle

Phlox —On the plains sow from August to October, unrivalled for brilliancy and richness of colour,



PHLOX

specially adapted for bedding out, has a spreading habit and may be used also for edging, especially the dwarf varieties, tall varieties grow to a height of about 1 foot while the dwarf varieties are from four to six inches high

Platystemon —Very much like Californian Poppy and should be treated in the same way

Poppy —In the hills sow from September to November, does not like transplanting and should be sown thinly in rich soil, grows to a height of from 2½ to 3 feet, should ultimately be thinned out to 18 inches apart

Portulaca.—No plants can be more brilliant and various in their shades of colour; can be sown at almost any time of the year; those sown to flower during the dry weather make a better show; requires a sandy soil and full sunshine.

Rodanthe.—Make lovely pot plants growing to a height of $2\frac{1}{2}$ feet, showing a mass of flowers; frequent transplanting benefits them and increases the size of the flowers which are bright rose, the calyx being silvery.

Salpiglossis.—In the hills sow in October and keep over to Spring when they will flower; grows to a height of about three feet; requires a deep rich, well prepared, slightly sandy soil; plant 18 inches apart; the flowers are bell-shaped and beautifully pencilled in a variety of gorgeous colouring.

Saponaria.—Most effective plants flowering in great profusion; flowers resemble Phlox; requires transplanting in a good rich soil.

Salvia.—On the plains can be sown from August to October; very effective in beds and herbaceous borders; many varieties, but the scarlet flowered one is the most effective; height three feet.

Scabious.—Several varieties of various colours; requires a rich compost; height two feet.

Schizanthus.—Not successful on the plains where the hot weather kills them before they have time to yield their flowers; in the hills sow in October and keep protected during the Winter; will not transplant; height about two feet.

Schizopetalon.—Does not transplant; in the hills sow in October and protect during the Winter; flowers white and purple of different shades at the same time; almond scented, especially in the morning; flowers close in the evening.

Sphenogyne — Useful for massing, flowers sulphur-yellow with a purple centre, in the hills sow in Autumn and protect in Winter, will flower in Spring

Statice — Very pretty flowering plants, requires a rich soil, height two feet

Stocks — Do not do well on the plains, may be had in a variety of colours, plant a foot apart, ten-week type recommended for cultivation

Sunflower — The large varieties are more useful for shrubberies, the small varieties produce a succession of bloom if sown every two or three months and come in very useful for cut flowers

Sweet Sultan — Useful for cutting, height about two feet, requires a light soil, transplant 18 inches apart

Torenia — Pretty herbaceous pot plants 6 to 12 inches high, makes a bold show in a bed or border, on the plains sow in June

Verbena — Valuable bedding plants, height 9 to 12 inches, requires a light but very rich soil, will flower for a longer period than many other annuals, if cut back after flowering and watered will flower again

Viscaria — Very effective planted in masses, height 18 inches, requires a rich soil

Wartzia — Everlastings, plant in clumps, flowers white or golden yellow

Whitlania — Bell-shaped flowers, height 15 inches, requires a rich soil and lots of water

Zinnia — On the plains sow in June and July and in the hills sow in May, grows to a height of about three feet and is useful for cut flowers



CLARKIN

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Chapter Ten.

SWEET PEAS.

SWEET Peas should be cultivated in the sunniest part of the garden and do best in trenches lying North-South, so as to get the full benefit of the sun.

They will grow in any good garden soil, although they prefer a sandy one, the one essential being drainage. The preparation of the soil is of first importance and the chief secret of success. The first operation is to clean the ground of all weeds, after which it should be trenched thoroughly to the depth of at least two feet. If possible, this should be done evenly and not merely in the trenches that the plants will occupy. The trenching should be done at least a month or two before sowing time and if animal manure is available it may be incorporated with the bottom soil. Bone meal should also be applied at the rate of four ounces per square yard. When sowing time is approaching the surface soil should be got ready by spreading available manure and decayed rubbish with wood ashes and Superphosphate at the rate of two ounces per yard and digging it well in below the surface. Sweet Peas like a firm soil and if this happens to be of a sandy nature, should be treaded on.

The next consideration is to arrange for the supports and this ought to be done before the seed is sown. Sweet Peas should be allowed to grow as high as they will and staking should be arranged for at least to a height of six or eight feet. Generally twiggy branches of various plants

are used, but wire netting is perhaps the easiest and neatest. Another method is to sink stout posts into the ground at intervals of about fifteen feet or so and fasten three strands of fencing wire to these, then bamboo splits are drawn



SWEET PEAS

down alternately between these. Whatever method is adopted it is advisable to do it before sowing the seed. The distance apart between the rows should not be less than five feet.

In the plains the seed is sown in October, earlier sowings have been attempted, and if they can be saved from the effects of a deluge of rain, blooms may be had by Christmas time. In the hills sow in Spring. The trenches should be thoroughly watered a few days before sowing so as to allow

the soil to settle. Then a furrow, sometimes two, is made along the centre of each trench and the seeds dropped in about four or six inches apart. The seed of some varieties are very hard and the skin quite impervious to water, resulting in irregular germination. To avoid this chip through the hard black skin exposing the yellow seed underneath, taking care not to bruise the white ridge which is on every seed. The whites and the creams and generally the true lavenders are thin skinned and do not require this treatment. The ground should be moist, but not wet, and in a heavy soil it is a good plan to cover each seed with a little sand. The seed generally germinate in a week or ten days.

As soon as the young plant produces its second pair of leaves, short, twiggy branches about a foot in length should be inserted between each plant, and as the plant grows it must be fixed at various places to its supports. Watering must be regularly attended to as the plants must not be allowed to receive a check. The more the flowers are picked and seed formation avoided the longer will the plants bloom.

For exhibition purposes Sweet Peas should receive special treatment. First decide how many stems to carry up from each plant; strong growing varieties usually three, weak ones not more than two. Tie these stems from the very start to the stakes. All the tendrils should be removed and growths other than the flower stem which come out at the joints should also be removed, so as to concentrate the whole strength of the plant on the development of the flowers.

Liquid manure is of great advantage and without doubt the best is that made from fowl manure. As much as can be procured should be gathered and put into an old tub to soak for a fortnight. Before applying, it should be diluted to the colour of weak tea. Sulphate of iron is a good stimulant, especially in sandy soils, and should be dissolved in water at the rate of an ounce to a square yard.

For the show table the blooms should be picked early in the morning and immediately placed in water to avoid wilting, for once the flowers wilt they never recover their former freshness; in case of having to pick the flowers the previous day, it should be seen that the top buds are not fully expanded. In arranging the show box due thought must be given to the proper arrangement of colours. The greatest contrast possible should be made throughout the exhibit.

The following is a selection of 25 all-round varieties —
Albury Lavender — A true lavender and is a popular variety

Brookvale Gallipoli — Brilliant red

Blue Flake — Streaked dark blue

Chocolate Flake — Streaked chocolate

Concard Chief — A very deep maroon

Concord Superb — Rosy cerise

Dreamland — Pale pinkish white, wings edged pink

Defiance — Orange scarlet

Devonshire Cream — A lovely cream

Daybreak — Creamy white shaded pale pink in wings

Exquisite — Light apricot pink

Grenadier — A very fine scarlet

Glorious — Salmon

Glitters — Rich reddish orange

Harlequin — White ground striped red A very pretty variety

J A Quarrel — Rich crimson red of excellent type

Marie Cheshyn — Apricot on cream ground

Milkmaid — A pure white

Monarch — The deepest red with good resistance to burning

Orange King — Pure glowing orange

Pierrott — Pale pink

Pink Flake — Striped pink, very much like Harlequin.

Purple Flake — Striped purple

Sapphire — Delightful shade of mid-blue

Snowbird — Large well waved flowers of pure white

Vulcan — A magnificent glowing orange scarlet

Chapter Eleven.

THE CHRYSANTHEMUM.

THERE are three distinct objects for which Chrysanthemums are grown. First, for specimen plants in which the beauty of the individual flower is subordinate to the training of the plant to some particular shape; second for conservatory decoration where the object is to get a brilliant mass of colour irrespective of individual flowers or shape of plants; and third for the beauty of individual flowers only without regard to the number of flowers or the shape of the plant.

The Chrysanthemum is in full bloom during the months of November and December. As soon as the blooms are used, the stems should be cut down to within a foot of the soil. A number of suckers will spring up from the roots and these form the cuttings, by which method the plant is propagated. A cutting should be about three inches long, cut off at the soil level, possessing a few leaves with no sign of bud in the centre of the growth, sturdy and of a dark green colour. These should be inserted in pure sand in pots. The fewer the waterings the cuttings receive the sooner they will strike, but the sand must not be allowed to dry out. Plunging the pots hastens root action. Another method is to divide the old crowns and pot into six-inch pots in a mixture of one part good garden soil, one part sharp river sand and two parts well-decayed leaf mould. It is possible to raise Chrysanthemums from seed, but such plants usually produce only single flowers.

It is not wise to leave the cuttings in the pots too long, they should be potted on as soon as they have rooted. The compost should be made up of two parts good loam,



ANNUAL CHRISANTHEMUM

one part manure and one part of wood ashes and coarse sand in equal proportions. This should be thoroughly mixed together and made slightly damp before being used. Never use a soil which is too wet as it would clog together. Firm potting is not necessary at this stage as it induces a too hard growth before it is advisable that such should be produced. After potting do not water until the plants begin to flag slightly, then give sufficient to saturate the soil and never allow them to flag for want of water afterwards.

POPULAR PHRASES EXPLAINED

With regard to growth, allusion may first be made to the first or natural break. When plants are pinched or topped to induce the required buds to form, it dispenses with the first or natural break.

The "first break" is caused by the formation of a flower bud in the point of the young growing stem. This bud causes other branches to start from the axils of the leaves below the point where the flower bud has formed. The time when this first break is made, varies. It is a question of variety at what height the plant will show the first bud. If the plants are vigorous and grow away freely, the shoots resulting from the formation of the flower bud is usually limited to three, and the "second break" will take place a few weeks later. The bud then developed is known as the "crown bud," termed by some the "first crown." When these are retained or "taken," the first and second are the only two breaks such plants make.

By the removal of the first crown bud the plants are induced to form another bud or "second crown." This treatment then produces another break and the bud then formed is known as the "second crown." If this bud were removed the shoots following would produce other buds, these are known as "terminals," because they constitute the termination of growth. Terminal buds are the best to depend upon for the production of flowers from bush plants. The blooms from these buds are generally very small. They differ considerably in colour from those produced from first or second crowns in the same variety.

A crown bud is always surrounded by young shoots and terminal buds always develop in clusters at the termination of the plant's growth.

TYPES.

The modern Chrysanthemums are divided into several types, the chief of which are the Japanese, the Incurved and the Reflexed. These take the largest place in shows. Then there are the Anemone flowered, both large and small, and the Pompones. The Plumed or Hairy Chrysanthemums are of the Japanese type, but the petals on the reverse and outer side are covered with a hairy pubescence.

BUSH PLANTS

A greenhouse filled with bush plants as a groundwork, with a few specimen blooms standing up among them, is a beautiful sight, besides supplying flowers in quantity for cutting

When the plants are about six inches high pinch out the point to induce the formation of side branches, and when young growths appear shift the plants into larger pots, pressing the new soil firmly around the old ball of earth. From three to five shoots are usually produced from the first topping, any weak ones among them should be removed. The shoots left should again be topped when they are about six inches in length and as a result of this practice from nine to twelve shoots will develop. This number is sufficient to form a fairly large specimen, and if all fresh breaks and side shoots are subsequently removed, each shoot will produce a flower of good size.



A young plant stopped to make a bush

Up to this stage only a slight staking is necessary, but as the plants grow bigger the staking must be increased. Eight-inch pots are large enough for moderate sized specimens and ten-inch pots for plants carrying a

dozen shoots. The grower must be guided by the number of shoots desired; if they are too numerous the flowers produced are small and do not develop properly.

Syringing during the summer months plays an important part in helping to secure clean growths and in keeping insect pests at bay. The plants should be syringed in the morning as soon as the sun shines on them, and again late in the afternoon. During very hot days an additional syringing at noon is beneficial. When the dewy nights of September come the afternoon syringing should be done early or it will favour an attack of mildew. As the weather gets colder one daily syringing will suffice. As soon as the buds begin to form, liquid manure should be given two or three times a week. For weak growing plants or those that are pale in foliage, a tablespoonful of Sulphate of Ammonia should be dissolved in the liquid manure once a week till an improvement in the colour of the foliage is noticed.

THE FINAL POTTING.

This is the placing of plants grown for large blooms in their flowering pots. Before potting is done plenty of roots should be working around the whole ball of soil, as they are then in a right condition to take hold of the new soil quickly. The correct course to pursue is to select the most forward plants for potting, and let the others remain until they are in a similar condition. The compost necessary for this potting should be composed of one part loam, one part sand, two parts leaf mould, two parts well-decayed cow manure and one part old mortar, rubble and wood ashes in equal quantities. In proportion to a basketful of this mixture add a quarter of a pound of bonemeal.

Pots from eight to ten inches in diameter are suitable ones to employ. When potting, a sprinkling of soot over the drainage will be of great benefit to the plants by the time the roots reach it. Pot firmly, using a blunt

stick to press the soil well "home" Very strong growers can scarcely be potted too firmly If the soil be made as hard as the proverbial "brick," so much the better, with weaker growing varieties less firm potting is advantageous

In the compost for very weak plants mix a liberal addition of leaf soil and finely powdered charcoal

After potting, syringe the plants two or three times a day during bright weather, and avoid overwatering If there is much rain turn the pots on their sides to prevent the soil becoming sodden

About two months or so after this final potting the plants should receive a topdressing, which will encourage surface roots, assist the buds in swelling, and benefit the general health of the plants The compost used should be made rich by the addition of leaf mould and artificial manure Before applying the topdressing the surface of each pot should be carefully and lightly removed, and then the compost applied to the depth of about an inch, making it firm, and then watering with a fine rose can until it becomes settled

FEEDING

This is an important detail The failure of many blooms could be put down to the effects of over-feeding at some time or another during the season A capital time to start the liquid manure is when it is found the pots are fairly full of roots For the first fortnight weak soot water should only be given, increasing the strength until it is the colour of pale brandy Strong doses must not be used at any time Never apply the liquid manure when the soil is dry On weak growing sorts never over-water at any time and the liquid manure must be used very weak It is advisable to frequently change the diet, farmyard manure forming an excellent change, occasionally giving soot water for a few days Superphosphate at the rate of half an ounce to the gallon of water is excellent

In showery weather plants may receive a dusting of some artificial manure in place of liquid manure. As soon as the plant is on the point of showing a bud stop feeding for a few days until the bud has commenced to swell, as during bud formation plants are apparently at a standstill for a few days. As soon as the buds are well on the move feeding may be commenced again, and continued until the flowers are half out.

USEFUL HINTS.

Air and light are essential during all stages of growth. When plants are arranged in rows, the rows should run from North to South, as the sun then falls more evenly on every part. Plenty of space should be allowed between the rows and also between each pot.

Occasional syringing with soot water improves the leafage and serves as a preventative to insect and mildew ravages.

All buds below terminal buds should be removed. This operation is called "setting the bud."

Sun-warmed water should be used for watering purposes as it tends to keep the plants in health.

All suckers must be removed till flowering is over.

To obtain large bushy plants and hundreds of flowers, the best way to secure both quickly and easily is to grow on the roots of the previous year.

Size of leaf and apparent vigour of plant is no guide to good bloom.

Mulching the soil in dry weather is very effective.

Never stop and shift on the plants at the same time; at least ten days should be allowed between these operations.

A manurial mixture is made up as follows —Saltpetre one part, phosphate of soda two parts, sulphate of iron a quarter part, magnesia two parts, and superphosphate of lime three parts, or,

Kainit three parts, sulphate of iron a quarter part, superphosphate three parts, nitrate of soda one part

These mixtures should be applied at the rate of a quarter of an ounce to a basketful of soil used in potting. They can also be used as a liquid food, using a quarter of an ounce to a gallon of water. Sulphate of iron imparts a dark green colour to the leaves and tends to keep the plants free from disease.

PESTS

When the Chrysanthemum is in a vigorous state of growth it is singularly free from disease, and as prevention is better than cure all endeavours should be made to keep the plants in as healthy a state as possible.

The Aphides, both green and black, are a source of trouble and must be attended to as soon as discovered. They attack the points of the plants and curl the tender leaves. If allowed to remain too long the leaves are crippled and the growth of the plant receives a check. As soon as discovered the affected parts should be dusted with tobacco powder and in obstinate cases the points should be dipped in a strong solution of tobacco water.

A stuffy, too moist atmosphere, too little ventilation, overfeeding and unripe wood is the cause of mildew and rust. These require prompt checking and the affected parts should be dusted with sulphur while remedying the causes. Rust usually makes its appearance on the under side of the foliage and in its early stages a small, brown spot.

Damping, though less likely to occur in India than in England, is also caused by lack of ventilation and too

moist atmosphere, and is indicated by small spots on the petals, which go on increasing gradually till the whole flower is involved and rots away.

Sometimes the plants lose their lower leaves, which first get black spots on them, and then wither. This is chiefly caused by the soil being too clayey and not friable, and also from bad drainage.

Earwigs which are usually found in the young growth or where there is a leaf curled up, should be carefully looked for and destroyed.

Another pest is the leaf maggot which can be traced by the small white lines it makes between the tissues of the leaves. They can be killed by squeezing between the fingers.

Recent experiments have shown that spraying with a solution of salt water is a cure and a preventative against attacks. Two pounds of rock salt should be dissolved in a couple of gallons of water. This solution mixed with two or three times its quantity of water should be used as a spray. Care must be taken not to use it too strong as it is apt to burn the foliage.

EXHIBITING.

In judging, size counts greatly, especially in conjunction with depth and solidity. "Finish" or neat appearance, which is due a great deal to careful dressing, especially in the incurved class, tells largely; and freshness and colour are indispensable. The beauty of each bloom and the appearance of the whole stand is enhanced greatly by a little judicious dressing. By "dressing" of the flowers is meant the removal of all twisted and malformed petals, and this should be commenced while the blooms are developing and not left until they are cut and ready to place on the show table. These misplaced petals should be carefully pinched out with tweezers,

allowing the others to grow into their proper places. When the blooms are three parts developed, the centre composed of small yellow florets will be visible and these should be removed otherwise they will cause the central florets of the Incurved varieties to reflex instead of incurve towards the centre.

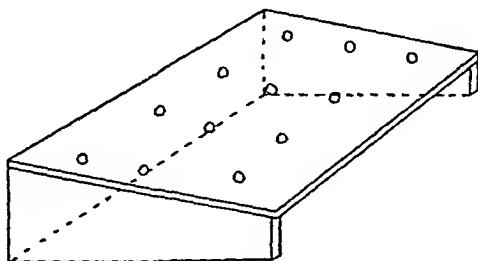
At the final dressing place the largest blooms of the Incurved varieties in the back row, grading in sizes to the front, so that each row appears even in depth and width. Some of the Japanese varieties produce such immense blooms that it would be impossible to place all the largest sorts in one row without crowding. Therefore the blooms must be judiciously intermixed. Although the darkest hues are generally placed at the back, the colours on the stand must be blended in the most pleasing manner.

The blooms must be carefully labelled and true to name. The lettering must be bold, easily read and be clear off the flower. The best method of labelling is to fasten the labels on an upright wire, which has been firmly attached to the back of the stand. Each label should bear the names of the three blooms immediately in front of it.



Tweezers and brush for dressing Chrysanthemums. The brush is made of camel hair and is used to free the blooms from dust.

According to rules, stands for 12 Incurved blooms must be 24 inches wide from left to right, and 18 inches deep from back to front, six inches high at the back and three inches at the front. The holes must be six inches apart.



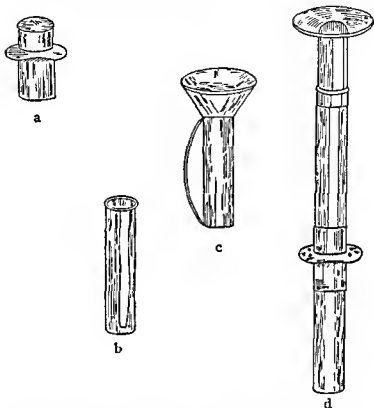
Two "twelve" boxes may be used for twenty-four blooms, three for thirty-six and so on.

Stands for six Incurved blooms must be 12 inches wide from left to right, and 18 inches deep from back to front.

For 12 Japanese blooms, the stand must be 28 inches wide from left to right, and 21 inches deep from back to front and the holes seven inches apart. For six blooms the stand must be 14 inches wide and 21 inches deep.

All stands and their supports must be painted green. A most important part of the box is the tube for holding the flowers. One of the best forms of a cup and tube is known as the "Springthorpe." All the parts are made of zinc which prevents corrosion. The foundation of the socket, *a*, into which the tube slips is permanently fastened to the stand with four small nails. The tube, *b*, is four inches long and contains the water. On the outside is fixed a slightly curved strip of brass, which admits of the tube being raised or lowered at will. The cup, *c*, into which the bloom is drawn, is four and a half inches long and the flange at the top is two and a half inches in diameter. This cup and tube is suitable for Incurved blooms, but for the larger type of Japanese blooms, the flange should be

three inches wide and almost flat, d An additional piece of tubing is an addition to the ordinary tube and is nine inches long and used to raise the back row of the Japanese



blooms to such a height as to give them space and elevation above the middle row. Being cut in the manner described, it is telescopic, and is easily raised or lowered at will.

It must be remembered not to cut the flowers till the day of the show. If a flower is fully expanded a few days before it is wanted, remove the plant to a cool, moderately dry shed or room, and it will make no progress for some time. In cutting, use a sharp knife and slit up the stem for an inch or more, and put the bloom in water in which there is a pinch of ammonia or salt.

SELECTIONS.

JAPANESE VARIETIES.

Ajax.—Rich yellow, shaded bronze. Large.

Alaunia.—Bright pink.

Alfred Wilson.—Chestnut crimson with gold reverse.
Full.

Badger.—Brilliant crimson. Reflexing florets.

Beatrice May.—Silvery white. Large flower.

Belle Chimose.—Deep golden yellow. Petals reflexing.
Large.

Ben Wells.—Blush white. Long florets.

Boule D'Or.—Deep yellow, flushed bronzy red. An
immense flower, both broad and deep.

B. W. Bennett.—Dark yellow. Broad petals.

Capt. John Dalgety.—Pale pink. Broad petals curling
at the tips.

Charles Davis.—Canary yellow. Large, gracefully
curving florets.

Cloth of Gold.—Golden yellow.

Col. Walter Beckett.—Deep rose on white ground.
Broad, drooping florets curling at the tips.

Coronation.—Rich deep rose. Very large.

Daily Mail.—Rich golden yellow. Large, broad petals.

Daily Sketch.—Rich deep rose with lighter reverse.
Broad and reflexing.

Distinction.—Soft salmon with straw coloured reverse.

Duchess of York.—Rich rosy purple. Reflexing.

Edith Cavell.—Light chestnut with gold reverse.

Edith Jameson.—Creamy white, richly overlaid with
bright pink.

Edith Pearce.—White. Large flower of fine form.

E. G. Sawyer.—White. Curling and interlacing.

- Ella Dalby*—Yellow Narrow, undulating petals
- Elsa*—Dark yellow
- E N Ward*—Orange bronze with yellow reverse
Broad florets Dwarf
- Eta Turner*—Deep amaranth with plum shading
Large, broad reflexing florets
- Excelsior*—White, striped and flushed rich rose pink
- Frances Jolliffe*—Yellow, edged chestnut
- Franconia*—Orange amber Long petals
- Fred Green*—Rich velvety purple
- Freya*—Heliotrope Large Petals reflexing and
twisting at the tips
- F F Taggart*—Rich yellow
- Gallipoli*—Dark pink Tubular petals
- General Hutton*—Deep yellow Large
- Gertrude Peers*—Crimson Reflexing florets
- Godfrey's Eclipse*—Clear canary yellow
- Golden Champion*—Beautiful golden yellow Large
- Goliath*—Reddish, shaded crimson and yellow, with
tanny reverse
- Hammond Phillips*—Light pink Long drooping
petals
- Harry Clement*—Golden buff
- H E Converse*—Reddish bronze with a gold reverse
- H Townshend*—Lovely shade of dark pink
- Hugh Mitchell*—Deep velvety crimson with gold
reverse at tips
- H V West*—Deepest yellow Long, broad petals
Whorled
- Irene Beane*—Deep chestnut crimson Broad reflexing
petals
- Iris Cross*—White Long drooping petals

James Baxter.—Reddish crimson amaranth.

John Reid.—Splendid shade of wine colour with silvery reverse.

J. S. Lloyd.—A primrose sport of the variety Wm. Turner.

Kara Dow.—Rich golden bronze.

Lady Edward Millar.—Deep yellow. Whorled and incurving petals.

Lady Stradbroke.—Pale heliotrope. Slightly incurved.

Lancashire.—Yellow. A fine variety.

Leicester.—Chestnut bronze with gold reverse.

Lord Lambourne.—Chestnut red with golden reverse.

Louis Boehmer.—Creamy white. Hairy.

Maisie.—Maize yellow, shaded bronze. Prettily incurved.

Majestic.—Intense golden amber.

Marjorie Woolman.—Strawberry bronze, incurving petals of gold in centre.

Mary Farnsworth.—A mixture of salmon, buff and crimson.

Mauretiana.—Velvety crimson. Lower petals incurving.

Medusa.—Pale salmon bronze.

Miss Alice Edwards.—Rich chestnut red. Large.

Miss Lillian Hall.—Lovely shade of lilac mauve.

Miss Lucille McGregor.—Bright crimson scarlet.

Mrs. Alice Batty.—Rosy mauve with silvery reverse. Large.

Mrs. C. Swaisland.—Yellow on white ground changing to lilac.

Mrs. Charles Russell.—Rich ruby crimson. Incurving at tips.

Mrs. E. F. Jones.—Rich golden yellow. Broad petals.

- George Carpenter*.—Nankin yellow, shaded orange.
Gloria Des Marches.—Pure white.
Golden Butterfly.—Grand golden yellow.
Harry Wonder.—Reddish bronze.
In Memoriam.—Rich velvety crimson.
Ivy Gay.—Beautiful shade of pink.
Jean Pattison.—Rich bronze.
Jenny.—Glistening snow white.
Jessie Serjeant.—Mauve pink with white zone near centre.
Kathleen Thompson.—Crimson red tipped with gold.
Lady Brunton.—Deep golden bronze.
Mayfield Surprise.—Old rose with gold tips.
Medoc.—Mauve pink. Large blooms.
Miss E. Hudd.—Vivid chestnut scarlet.
Miss Mary Wells.—Fine crimson scarlet.
M. Julian Valat.—Fine pure white.
Mona Davis.—Bright mauve pink.
Mrs. C. Armitage.—Rich amber.
Mrs. Percy Witchell.—Richest golden yellow.
Nesta.—Soft pink.
Phyrne.—Lovely pink.
Primrose Poitou.—Beautiful primrose colour.
Ruby Jones.—Deep yellow.
Sheba.—Deep crimson.
Sultan.—Deep maroon crimson.
Sungold.—Gold, shaded chestnut.
The Pilgrim.—Bright red changing to chestnut red.
The Wizard.—Deep bronze.
Tiger.—Bright yellow.

Winter Cheer — Deep pink

Winter Gem — Bright orange

ANEMONE FLOWERED VARIETIES

Aphrodite — Mauve pink, slightly tipped gold

Irmine — Lovely pale pink with blush cushion

Caliban — Bright orange, shaded terracotta, with golden cushion

Ceres — Canary yellow with deeper centre

Cordelia — Cinnamon bronze

Elspeth — Pale mauve pink, tipped gold

Godfrey's Perfection — Pure white

Golden Nymph — Lovely straw yellow with golden cushion

Heloise — Delightful salmon pink

Miss Archer — Bright rosy pink

Nerissa — Bright chestnut with gold centre, shaded green

Thora — Bright rose pink

Wendy — Amaranth, lighter towards centre

Winsome — Lovely crimson

POMONES

Black Douglas — Very dark maroon

Crimson Perfection — Rich crimson

Francis Hutchinson — Rich claret

Klondyke — Brilliant yellow

Lilian Doty — Lovely mauve

Mdlle Dordan — Beautiful silvery pink

Prince of Orange — Bright orange amber

Snowball — Purest white

Ivm Westlake — Golden yellow

Chapter Twelve.

THE ROSE.

THE Queen of Flowers is cultivated with remarkable success in this country, where it finds both the soil and the climate congenial to it. It delights in an open situation and should be given a special portion of the garden to itself. Whether the garden is large or small there is always a portion that can be found to be devoted entirely to roses. And Dean Hole has truly said "to have lovely roses in your garden you must have lovely roses in your heart," and there is no doubt at all that success in rose culture is just a question of the depth of one's regard for them.

The soil can barely be made too rich, and in cool climates horse manure is more beneficial than cow-dung. The beds should be dug at least three feet deep and four or five feet wide, according to the number of rows of plants it is contemplated to plant in them. Leaf mould, bone meal and well decomposed cow-dung should be thoroughly mixed with the soil before it is put back, and the beds should be thoroughly watered previous to planting to allow the soil to settle. The plants should be put down at least three feet apart.

The rose is divided into two classes: the Summer bloomers and the Autumn bloomers. The former, however, can only be cultivated with success in hill stations at altitudes over 4,500 feet. The Summer roses comprise the

Cabbage or Province Rose (*Rosa Centifolia*), the Moss Rose (*Rosa Mucosa*) the French Rose (*Rosa Gallica*), the Damask Rose (*Rosa Damascena*), the Scotch Rose (*Rosa*



PINK PEARL

Spinosissima), the Sweet Briar (*Rosa Rubiginosa*), the Austrian Briar (*Rosa Lutea*), the Airshire Rose (*Rosa laevis*), the Evergreen Rose (*Rosa Semperirens*), the Boursault Rose (*Rosa Alpina*), the Banksian Rose (*Rosa*

Banksiæ) and *Rosa Multifolia*. The Autumn roses comprise the Hybrid Perpetual, Hybrid Tea, Tea, Noisette, China, Perpetual Damask, Bourbon, Miniature, and the Musk. These also do well in the hill stations. The Hybrid Perpetual is generally more hardy than the Hybrid Tea, but the latter is the type in more general favour.

Roses do much better in the ground than in pots. When grown in pots they require good drainage, otherwise the soil soon becomes sodden; on the other hand roses grown in pots are liable to become dry if not carefully watched, and this is a serious check, especially during the growing season. When roses are planted it is of the greatest importance that the soil must be firmly pressed down round the roots; many failures can be traced to loose planting. The surface soil must be kept constantly stirred with the hoe, especially after watering. It must be remembered that roses are rank feeders, and when they are doing well, they can utilise any amount of manure. Soot is invaluable as a help to colour, and can with advantage be freely used when buds are showing.

There are three or four methods usually employed in propagating roses. Cuttings should be planted in a prepared trench, the soil of which has been thoroughly mixed with sand, and the soil pressed down firmly around the cuttings. Tea and Noisette cuttings root best during the rains, while cuttings of other varieties do best at the close of the rains. Layering is another method sometimes adopted. The most common method is budding, and is practised with the greatest success in the drier parts of India. The best time for this method of propagation is after the rains when the sap begins to flow freely. In Lower Bengal this method is not attended with very great success.

The object of pruning is to keep the plants young. The quality of the bloom is always in proportion to the

strength of the shoot that carries it and the strength of the latter in proportion to how low down it starts. As a general rule the weaker the grower the harder it must be cut. The chief consideration in pruning is to see that the wood is ripe before the operation. Nothing is gained by early pruning and the best time is in October and November. Of course there is some difference in time in various parts of India, but usually the wood is ripe enough a couple of months after the rains are over. The Summer roses must not be pruned heavily, only thinned out of twiggy growth and the longest shoots shortened. Tea and Noisette roses require careful pruning, the long shoots should be slightly shortened and weak laterals thinned out. It is a good plan to artificially Winter the plants before pruning. The soil around each plant should be carefully removed until the roots are exposed. They should be exposed for a week or so until the leaves show signs of going yellow and fall off. Then a compost consisting of one part loam and three parts of good decayed cow-dung should be filled in and pressed firmly down among the roots. Watering should not be done till the plants show signs of coming into growth, and then should be copiously given. To assist good blooms to form it is a good practice to disbud. This must be done early when the buds are the size of peas, leaving the centre one to swell and develop. The pruning of climbers is quite a different matter. It is useless to expect much from a climber till its roots become well established, and when newly planted the best shoots should be pruned hard back to seven or eight eyes and the weaker growth cut right out altogether.

Of the many forms in which roses are grown, the dwarf and the standard are the most common. The "dwarfs" are either roses on their own roots or are budded plants. The "standards" are desirable plants and form pretty objects in the garden along a drive or

planted in the middle of a bed of dwarfs. They are usually made of different heights, but this can only be decided at the time of budding, as a great deal depends on the growth of the stock plant. Other forms are the pyramid and pillar roses. All semi-climbers and any very strong varieties, such as Frau Karl Druschki and Hugh Dickson, when once firmly established may be pegged down the whole length of their shoots and they will bloom profusely from the laterals thrown up.

It is extraordinarily difficult to make a selection of roses to meet everybody's approval, but the following is a list of those of tried merit:—

Admiration. H. T.—Cream, shaded vermilion. Blooms exceedingly full, long and pointed, with high centre and petals of good substance. Colour deepens slightly as the bloom expands. A free, continuous bloomer.

Abol. H. T.—White and exceptionally fragrant. Fine, large, full, bold flowers; edges of petals slightly flushed pink.

Avoca. H. T.—Deep scarlet crimson. Fragrant.

Betty. H. T.—Coppery rose outside, yellow or blush inside. Profuse bloomer and highly decorative rose.

Betty Uprichard. H. T.—Salmon pink and carmine. Sweetly scented. A particularly striking rose.

Cheerful. H. T.—Orange flame. Very fragrant. Free flowering.

Christine (Pernetia).—Golden yellow. The best bedding yellow rose.

Caroline Testout. H. T.—Pink. A favourite variety.

Chas. P. Kilham. H. T.—Nasturtium red. A most striking colour.

Columbia H T—Rose pink Very full and of good shape Blooms freely produced and of wonderful fragrance

Charles Lefebvre H P—Velvety crimson Rich colour and delicious scent

Clarice Goodacre H T—Chrome on ivory white Perfect shape

Colonel Oswald Fitzgerald H T—Velvety crimson Perfect shape

Dorothy Page Roberts H T—Coppery pink Free flowering

Dame Edith Helen H T—Pure glowing pink Exceptionally fragrant Magnificent large, self-coloured bloom, well formed with high pointed centre

Emma Wright H T—Orange Charming self-colour Free and continuous bloomer

Edward Mawley H T—Dark crimson Fragrant

Etoile De Holland H T—Bright dark red Very fragrant Good shape Perfect in bud Petals large and of good substance

Florence Izzard (Pernetia)—Deep buttercup yellow Splendid shape and perfect in bud

Frau Karl Druschki H P—Snow white Should be disbudded and responds to good treatment

Frances Gaunt H T—Fawny apricot Large bloom of quite good shape The red wood and dark green foliage, freely produced, is very attractive

Fisher Holmes H P—Bright crimson Fragrant

- Gen. McArthur. H. T.*—Crimson. Heavily perfumed and a free bloomer.
- Golden Emblem (Pernetia).*—Golden yellow. Good shape.
- Golden Gleam. H. T.*—Bright buttercup yellow, the outer petals streaked scarlet. An attractive rose for cutting.
- Gorgeous. H. T.*—Orange yellow, with reddish copper shadings. A good garden rose.
- Hadley. H. T.*—Crimson, black shadings, very sweetly scented. Perfect shape. Bud long and pointed and a fine bedding rose.
- Henrietta. H. T.*—Orange crimson. A delightful variety.
- Hoosier Beauty. H. T.*—Dark velvety crimson. Perfect shaped bloom and remarkably fragrant.
- Hugh Dickson. H. P.*—Crimson. Best grown pegged down.
- Independence Day. H. T.*—Orange shot with flame. Fragrant. Good bedding rose with blooms freely produced. Good shape.
- Ivy May. H. T.*—Coppery rose pink and amber. Fragrant. Buds particularly attractive, and of perfect shape.
- Joseph Hill. H. T.*—Copper, amber and pink. Perfectly shaped bloom.
- Lady Ashtown. H. T.*—Deep pink. Free bloomer.
- Lady Helen Maglona. H. T.*—Crimson with darker shades. Heavily perfumed. Large well shaped blooms.



LADY HILLINGDON

Lady Hillingdon T—Deep apricot yellow Free bloomer Delightful

Lady Inchquin H T—Orange cerise Large, full and perfectly shaped

Lady Pirrie H T—Coppery pink Perfect shape Distinctly fragrant

Lady Roundway (*Pernetia*)—Deep copper chrome Perfect shape Petals of perfect substance Good bedding rose

La France H T—Ivory pink with silvery reflex Fragrant

Lamia H T—Fawn pink to orange Petals of good substance

Laurent Carle. H. T.—Deep carmine. Fragrant. Full.

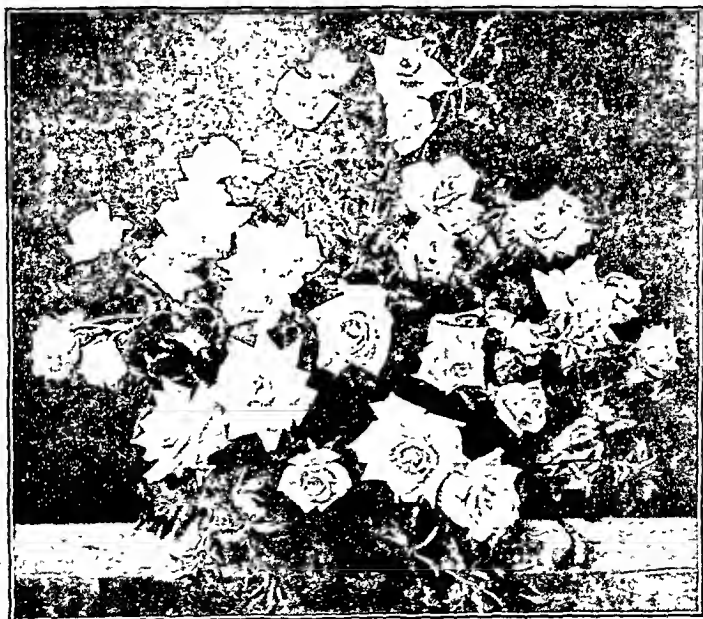
Lieutenant Chaure. H. T.—Crimson. Fully scented. Perfect shape.

Lord Lambourne (Pernetia).—Buttercup yellow, fringed carmine scarlet. Perfumed. Enormous blooms.

Los Angeles. H. T.—Pink and coral, shaded gold. Distinctly perfumed. Good shape.

Mabel Morse. P.—Clear, bright golden yellow. Large and globular.

Mme. Abel Chatenay. H. T.—Rose pink with a silver reflex. Distinctly fragrant. Shapely blooms. Good bedder and lasts well when cut.



MADAME BUTTERFLY.

Mme. Butterfly. H. T.—Salmon flesh shaded to coppery rose. Very fragrant. Perfect shaped bloom.

Mme Edouard Herriot — Austrian Hybrid Brick red terra cotta Unique colour Free, profuse and continuous bloomer Requires disbudding

Mme Jules Bouche H T — Creamy white with slight blush pink in the centre Large full bloom and perfect in shape

Marcia Stanhope H T — White Perfectly shaped, fragrant bloom

Margaret Dickson Hamill H T — Straw coloured to orange gold Very fine

Miss C E Van Rossem H T — Velvety red with scarlet shades Fragrant Good bedding rose Perfect in shape and a profuse bloomer

Miss Wilmott H T — Sulphur cream A good garden rose

Modesty H T — Pearly cream, tinted rose Sweetly perfumed Free bloomer

Mrs Aaron Ward H T — Deep yellow, edges of petals white Lovely shape

Mrs Alfred Tate H T — Coppery salmon, shaded fawn A good bedder

Mrs B J Walker H T — Cerise pink Of considerable merit

Mrs C E Russell H T — Deep pink to rosy pink Strong perfume Very good

Mrs C V Harworth (Pernetta) — Crimson apricot to biscuit buff Lovely

Mrs Dunlop Best H T — Reddish apricot A charming rose

Mrs George Sawyer H T — Pale rose A desirable variety

- Mrs. H. Bowles. H. T.*—Rose pink and carmine. Fragrant. Exceptionally good. Large, full, perfect bloom.
- Mrs. Henry Morse. H. T.*—Silvery rose to cerise pink. Absolutely ideal shape.
- Mrs. Herbert Stevens. T.*—Paper white. Ideal shaped bud. Highly decorative.
- Mrs. John Laing. H. P.*—Pink. Particularly heavy perfume.
- Mrs. Wemyss Quin. H. T.*—Yellow. Good bedder and free bloomer.
- Ophelia. H. T.*—Salmon flesh with yellow at the base of petals. Very fragrant. A superb variety.
- Prince Camille de Rohan. H. P.*—Dark crimson, black shadings. Fully fragrant. Free bloomer.
- Rev. F. Page Roberts. H. T.*—Fawny yellow. Full and petals of wonderful substance.
- Richmond. H. T.*—Vivid crimson. Delightful rich perfume.
- Roselandia. H. T.*—Apricot yellow. Perfect shape. Highly decorative.
- Salmon Spray. H. T.*—Rich salmon pink, reverse of petals carmine. Sweetly scented. Large trusses of bloom.
- Shot Silk. H. T.*—Bright cherry cerise overshot with orange, flushed rose and buttercup yellow at base of petals. Fragrant.
- Sovereign (Pernetia).*—Deep golden yellow. Perfect shape and petals of grand substance. Free bloomer.
- Sunstar. H. T.*—Orange yellow edged with crimson flame. Distinctly fragrant.

The Queen Alexandra P—Vermilion on the face of petal with gold on the reverse Full

Victor Hugo H P—Crimson A most vivid colour

Viscountess Folkestone H T—White flushed with flesh Good bedder and profuse bloomer

IV F Dreer H T—Creamy yellow with salmon in the centre Free flowering

SINGLES

These are hardly equalled for garden display Suitable for beds and borders, and some of the strongest growers make very ideal hedges

Billy Boy (Pernetia)—Sunflower yellow Free flowering

Dainty Bess H T—Salmon pink and carmine Fragrant Lovely and large Borne in trusses Free flowering and exceedingly decorative

Irish Elegance H T—Coppery pink

Irish Fireflame H T—Apricot to yellow, heavily fringed with reddish orange Perfect shaped buds, good for buttonholes Free flowering

Isobel H T—Carmine salmon, yellow base A superb variety

Kitchener of Khartoum H T—Dark velvety scarlet Beautiful buds

Mrs Oakley Fisher H T—Apricot yellow Fragrant Very decorative

Old Gold H T—Coppery salmon with buff and orange shades Not quite a "true single" as it carries an extra row of petals to the usual five A good bedding rose and a charming variety

Red Letter Day. H. T.—Dark velvety scarlet. Carries an extra row of petals.

Simplicity. H. T.—Paper white. Petals large and of good substance.

POLYANTHAS.

The majority of Polyanthas bear small flowered, rambler type blooms. Of dwarf habit, the flowers are always borne in clusters.

Coral Cluster.—Coral pink. Very large truss of bloom.

Diana.—Orange yellow, heavily fringed carmine. Free flowering.

Ellen Poulsen.—Rose pink and carmine. Perfect shaped buds, and semi-double flowers, large, and produced in moderately full sprays.

George Elgar.—Apricot yellow. Freely borne in graceful sprays.

Golden Salmon.—Particularly fascinating.

Gwyneth.—Clear, bright sunflower yellow. Buds very slightly marked with crimson on the outside of petals, but disappears as the blooms open.

Kirsten Poulsen.—Vivid orange scarlet. Large single flowers, with very beautiful golden anthers, borne in large loose sprays.

Locarno.—Orange scarlet.

Mrs. Cutbush.—Pale pink. Clusters large and full. Freely produced.

Nurse Cavell.—Crimson. Full truss of bloom. Splendid.

Orange King.—Orange.

Orange Perfection —Vivid salmon orange Blooms fine and open well

Orange Queen —Orange

Orleans Rose —Red to rose with white centre Very large truss of bloom Free and continuous bloomer

Rodhatte —Cherry red Large loose clusters Exceedingly showy

Sunshine —Buff yellow, suffused bronze pink

Superba —Bright crimson Large trusses of fine, very large flowers

Yvonne Rabier —White Produced in bunches with great freedom and sweetly scented

CLIMBERS

Alberic Barbier (Hybrid Wich) —Creamy white Flowers fairly large and double, produced in clusters

Allen Chandler H T —Vivid scarlet Fragrant An effective pillar rose Blooms large and semi-single, produced in clusters

American Pillar —Deep pink Carries large trusses of bloom

Bouquet D'Or T —Buff yellow with a deeper centre

Caroline Testout H T —A climbing sport of the well-known variety

Conrad F Meyer (Rugosa) —Clear silver rose Fragrant

Cornelia —Strawberry, flushed yellow Fragrant

Crimson Rambler (Poly) —Crimson daisy-like blossoms in large clusters Suitable for arches and pergolas

- Cupid. H. T.*—Pink. An effective variety with huge single flowers, borne in clusters.
- Dorothy Perkins. (Wich.)*—Pink. Huge trusses of pink blossom. A rampant climber.
- Dr. Van Fleet. (Hybrid Wich.)*—Flesh pink. An attractive Rambler. Large, loose clusters of flowers. Delightfully fragrant.
- Emily Gray. (Wich.)*—Golden yellow. Free bloomer. Excellent variety.
- Excelsa. (Hybrid Wich.)*—The crimson Dorothy Perkins.
- General McArthur.*—A climbing sport of the popular variety.
- Gloire De Dijon. T.*—Buff salmon yellow.
- Heart of Gold. (Hybrid Wich.)*—Very dark crimson with white eye and large golden anthers.
- Hiawatha. (Wich.)*—Bright crimson. Blooms in huge trusses. Flowerets single with a yellow eye. Very good.
- Lady Gay. (Wich.)*—Cherry pink. Immense trusses.
- Lady Godiva. (Wich.)*—Salmon pink. Very attractive.
- Lady Hillingdon. H. T.*—A climbing sport. Beautiful.
- Lady Waterlow. H. T.*—Salmon blush, carmine edged. A very good climber.
- Leontine Gervais. (Hybrid Wich.)*—Salmon, rose and yellow. Borne in loose sprays.
- Marechal Neil. N.*—Deep yellow.
- Mermaid. H. B.*—Sulphur yellow. Lovely big single climber. Ideal pillar.

- Mrs Aaron Ward H T*—A climbing sport
- Paul Lede H T*—Apricot and rose shades
- Paul's Carmine Pillar H T*—Bright carmine
- Paul's Scarlet Climber (Hybrid Wich)*—Vivid scarlet
Carries huge trusses of bloom A most effective climber
- Phyllis Bide (Poly)*—Pale gold, fringed pale pink
Loose sprays of bloom
- Reve D Or V*—Buff Very pretty
- Richmond H T*—A climbing variety but much better
- Sanders White (Wich)*—Pure white Fragrant
Blossoms in heavy trusses
- Sunstar H T*—Yellow and flame A climbing sport
- Tea Rambler*—Coppery pink A charming climber
- Una H B*—White Blossoms large and semi-single
Pillar
- W A Richardson N*—Deep orange, sometimes with
a white edge Very good climber
- Zephyrine Drouhin B*—Deep silvery pink Partic-
ularly fragrant Semi climber and makes a very
fine hedge

Chapter Thirteen.

THE GERANIUM.

THESE are exquisite floral beauties and are indispensable for in-door as well as out-door decoration. As a rule they do not thrive in the plains.

Seeds germinate quite satisfactorily, but flowers from these plants will not always be found true to name, and they will frequently not show their peculiar variegation of foliage the first season. If such plants are kept a second or a third year, they will, with more wood, show their peculiarities more distinctly. Seed should be sown in the plains as early after the rains are over as possible, in pots composed of a light soil, chiefly sand and leaf mould with the addition of a little fine loam. They must be sown very thinly and the soil kept moist. When the plants are strong enough prick them out and plant them singly in three-inch pots in a compost of equal parts of loam, leaf mould and decomposed cow-dung. In hill stations seed should be sown in March and the pots plunged in a hot bed.

Propagation by cutting will undoubtedly yield the more certain and satisfactory results in the plains. The best cuttings are taken from side shoots. They may be procured from hill stations with a little moss rolled round them. Both in the plains and hill stations, these cuttings should be put down or taken from old acclimatized plants in August, September and October. They should be placed in a box, pot or basket, well drained and filled with

sand and leaf mould in equal parts, and a little loam. If pots are used, sink them in earth to the rim, and shade them from the sun wherever they are grown. Water them slightly to settle the compost, and take off all extra leaves, leaving only two or three of the uppermost on each shoot. In cold localities the cuttings should be protected from frost. The cuttings strike readily in the hills almost at any time if they are only sheltered from the sun, and kept in an airy place.

In the plains the cuttings must be put into pots as soon as they have taken root, which will be seen by their sending up new leaves. In hill localities they should remain till the middle of February, when they must be potted off singly into four-inch pots.

Although plants flower best when they are pot-bound, cuttings struck from acclimatized plants should be re-potted as they grow into larger pots.

They are rather untidy growers, but the shoots may be staked or tied down to form the plants. In cool climates the tops may be pinched off to make the plants bushy, but this is not desirable in the plains, where the best specimens will be obtained from cuttings put down early and they are required to make the most of their growth up to the end of February or March, after which time they will grow very slowly.

When the hot weather has fairly set in in the plains, the plants must not be exposed to the sun, but kept in a sheltered position. They must be sheltered from the rain and placed in well-drained soil. The soil must be well pressed down and water applied very sparingly.

Liquid manure is of immense benefit when applied when the plants are flowering, and goat or sheep dung is very suitable for this purpose.

Young plants never flower so freely as old ones, a plant eighteen months old will never bear the same number

of flowers as one four or five years old. They should not be allowed to grow leggy or tall, but must be grown bushy by pinching the shoots.

Geraniums require a soil rich in good old leaf mould with a minimum amount of animal manure, or else they will not flower satisfactorily.

Some very fine varieties can be imported and the following is a selection :—

SINGLE VARIETIES.

- Ada Negra*.—Rich purplish crimson, white centre.
Aldenharn.—Fine rich crimson
Arabic.—Bright scarlet, large white eye.
Beauty.—Lovely scarlet cerise.
Caledonia.—Blush pink. An exquisite shade.
Carmania.—Soft salmon rose. Large truss.
Chatsworth.—Orange scarlet.
Countess of Jersey.—Clear coral salmon.
Dream.—White, flushed pink.
General French.—Soft scarlet.
Goodwood.—Pure white, of good form.
Halo.—Rich salmon with a deep red centre.
Hawthorn.—Rosy scarlet, large white centre, with faint shading of mauve.
Hibernian.—Bright red, large bold trusses.
Indomitable.—Carmine purple, white centre.
Iris.—Brilliant crimson purple.
Iron Duke.—Brilliant vermilion.
Lady Folkestone.—A lovely pale pink.
Leonus.—Cherry crimson.
Mars.—Crimson.
Mary Pelton.—Very pale salmon.
Mentmore.—Rosy cerise with a white eye.
Mrs. P. Simpson.—Salmon edged with white.

- Pandora* —Deep orange scarlet
Peach —Clear cherry red, white centre
P R Johnson —Rich crimson, shaded orange
Queen Mary —Brilliant rosy red
Shelley —Rich deep crimson
Siren —Intense crimson scarlet, large white eye
Sydney —Lovely light pink
Venus —Purest white
Vindictive —Intense salmon red
Weydown —A very beautiful mauve

DOUBLE VARIETIES

- Astrachan* —Dark crimson
Baron de Layres —Beautiful pure white
Charari Hermanos —Brilliant scarlet
Communes —Amaranth, white centre
Dagata —Clear rosy mauve
Dr Ogier —Fiery garnet
Edmund Lachenal —Bright crimson
Golden Glory —Nearest approach in colour to an orange shade
Hermine —Fine pure white
Lady Candahar —Intense deep self-salmon
Laze —Brilliant orange scarlet
Lord Kitchener —Fine bright scarlet
Mlle du Planty —Lovely apple blossom colour
M L de Fourcoud —Pink, blotched white
Nydia —Creamy white, rosy centre
Pegusa —Intense crimson purple, white centre
Rainbow —Reddish salmon
Ryecroft Pride —Very fine deep crimson
Scarlet King of Denmark —Fine scarlet
Sonnini —Coppery salmon
Ville de Poitiers —Clear scarlet

Chapter Fourteen.

THE DAHLIA.

THIS is one of the most important of our garden plants and one very useful for cut flowers. It will thrive in almost any soil, but one rather light, well drained and moderately rich is preferable. The best results are obtained in a sunny situation.

Dahlias are grown either from seed or by division of the roots. The former method commends itself because of the ease with which a large number of plants can be quickly raised and be in bloom within five months of sowing. But as the Dahlia does not come true from seed, the best named varieties should only be grown by division of the roots. Seed is usually sown on the plains in October and in the hills in March. They are also propagated by cuttings. The tubers are put down at the same time as the seed. Soon after as many shoots as there are eyes in the tubers will appear and as soon as these are two or three inches high they should be taken off just below the leaves and each put into a small pot.

The Dahlia looks well massed in a bed. The beds should be well prepared and drained and manured. Frequent doses of liquid manure while the plants are in bloom are beneficial. Watering must be carefully attended to and the plants not allowed to wilt. It is a good plan to stir the soil the next day after watering. The bulbs should

be planted not deeper than from half to three-quarters of an inch below the surface. As the plants grow they should be staked, and only two or three shoots should be retained according to the strength of the plant.

The Dahlia is also largely grown as a pot plant, and makes effective decoration in a conservatory or the verandah.



DAHLIAS

When grown for show purposes only one stem should be allowed to each plant, and as soon as the buds begin to form give them doses of liquid manure. Only the centre bud should be retained, and as the colours are easily injured by the sun, the flower should be shaded, and also protected from heavy rain. The best time to cut the flowers is in the early morning or late evening.

When the plants die down the roots should be dug up and stored in dry sand.

The Dahlia is usually free from insect pests, but daily syringing with clear water will keep away any that intend to attack the plant. Green fly occasionally are a nuisance, but a spraying with tobacco water will clear them away.

Originally the Dahlia was a single flower, but in the hands of the florist it has developed into a large number of diverse forms and shapes. The "Tom Thumb" type is very suitable for bedding purposes and grows to a height of from twelve to eighteen inches and produces numerous sized flowers. The "Decorative" type is a handsome one producing double flowers, the petals of which are broad and flat. The flowers are produced in great profusion and in innumerable shades. The "Collerette" is a single flower of great beauty, having a row of smaller petals around the centre. The "Cactus" type, both single and double, have twisted petals of very bright colours. "Pompoms" have small flowers and there is a quilled variety of this. The "Fancy" type is striped or flaked in a great variety of colours.

SELECTION OF CACTUS VARIETIES.

Alabaster.—Purest white, of large size.

Albert E. Amos.—Crimson.

Buccaneer.—Beautiful crimson scarlet. Petals broad at base with narrow point. Very large.

Canary.—Pure yellow.

Caprice.—Dark crimson. Free flowering.

Caroma.—Clear yellow. Free flowering.

Champion.—Crimson scarlet.

Distinction.—Rosy cerise. Dwarf.

Dominion.—Old gold, tinged red on centre florets.

Doris Tisdale —Yellow centre gradually suffusing to chestnut bronze

Edith Page —Primrose at base, shading to orange and overlaid with a rosy tint

Elsie Prior —Yellow suffusing to light salmon Large blooms

Emperor —Rich purple crimson

Enchantment —Mauve pink

Flashlight —Clear primrose yellow

Frederick W'enham —Fawn pink with a salmon centre

Gigantic —Pure old gold

Gondola —Clear rosy pink

Gossamer —Rich pink with lighter tips and base

Harry Strutt —Rich crimson scarlet

J H Reed —A pretty shade of salmon scarlet

John Woolman —Pale apricot on cream ground
Immense flower

Magnificent —Deep orange

Margaret —Pure white

Mary Murray —Bronzy shade of orange scarlet to almost flame

Mary Segar —A very fine yellow

Miss Eckert —Clear pink with white centre

Mrs Alfred Harvey —Light salmon pink with darker shading

Oceanic —Orange shading to rosy tints

Paragon —Clear mauve with white centre and tips

Redpole —Deep crimson Dwarf

Ringouzel —Deep rose with white at the base of petals

Romeo —Base of florets yellow deepening to a red tint towards the tips

Rover.—Yellow centre, then scarlet, and yellow again at tips.

Royal Sussex.—Red shaded with orange.

Signal.—Orange scarlet.

Snowball.—A fine incurving white.

Trophy.—Crimson slightly tinged with rose.

Viceroy.—Pure orange scarlet.

Virginia.—Clear rosy pink with lighter shade at tips of petals.

DECORATIVE VARIETIES.

Africa.—Very deep maroon, almost black.

Aladdin.—Amber, lightly suffused scarlet.

Alice Amos.—Pure white.

Anna Kapel.—Amber pink. Very attractive.

Big Ben.—Deep purple. Reflexed and massive in form.

Berengaria.—Orange at centre and gold.

Bird of Paradise.—Rich purple, tipped white.

Black Prince.—Rich deep maroon.

Challenger.—Yellow, overlaid salmon, florets tipped rose.

Crimson Flag.—Brilliant fiery crimson.

Daily Mirror.—Pale lilac, suffused deeper colour, almost white at centre.

Delice.—A lovely shade of pink.

Dr. Jewis.—Soft salmon rose, suffused old gold

Erato.—Rosy mauve.

Fantasy.—Crimson.

Fireman.—Brilliant fiery scarlet.

Goldmine.—Combined maize yellow and gold.

Homeric.—A blending of yellow and deep rose.

- Jersey Beacon* —Bright scarlet with lighter reverse
J. L. Crowther —Warm buff apricot
J. W. Davis —Deep carise
King Harold —Deep mahogany red
Leader —Deep rose
Macdonald —Shining orange red
Mme. Herriot —Striking shade of coral red
Moloch —Fiery orange scarlet
Mount Everest —Purest white
Noble —Scarlet overlaying orange and distinctly tipped white
Porthos —Bluish violet
Psyche —Deep chrome yellow
Romney —Maroon crimson, black centre
Salmonea —Salmon pink
Silver Queen —Rich silvery pink
Siren —Shell pink Dwarf and free flowering
Tarzan —Brilliant orange red
Tommy Atkins —Flaming scarlet
Triumph —Rosy carmine
Wembley —Old gold with deeper bronzy tints
White Eagle —A beautiful pure white

POMPONE VARIETIES

- Apricot* —Deep apricot
Cecil —Bright scarlet
Cheerfulness —Old gold, tipped scarlet crimson
Daisy —A pretty shade of amber and salmon
Flossie —Silvery white, shaded rosy pink
Girle —Lilac mauve
Golden Gem —Bright yellow

Hedwig.—Chestnut gold.

Jessica.—Amber edged with red.

Ladybird.—Bright crimson lake.

Leila.—Reddish buff, tipped white.

Marietta.—Rosy red.

Mignon.—Dark maroon, shaded purple.

Peacemaker.—Pure snow white.

Pride of Berlin.—Delicate shade of pink with deeper centre.

Raider.—A very fine yellow.

Rosebud.—White, edged rosy pink.

Sunset.—Bright orange.

Thalia.—Rosy pink with a white centre

COLLARETTE VARIETIES.

Admiral.—Blackish maroon with pure white collar.

Beacon.—Crimson with yellow collar.

Brilliance.—Bright orange scarlet with clear yellow collar.

Bullfinch.—Brilliant crimson scarlet with yellow collar.

Cadet.—Rich maroon with pure white collar.

Clyde.—Claret with golden yellow collar.

Coronette.—Scarlet crimson with crimson collar suffused yellow.

Dainty.—Lovely rosy pink with yellow collar.

Eclipse.—Reddish crimson, edged yellow, with yellow collar.

Ina.—Maroon red with yellow base and yellow collar.

Ivor.—Orange scarlet with yellow collar suffused scarlet.

Le Congo Belgæ.—Maroon crimson with white collar.

Leo — Brilliant scarlet with yellow collar

Louis Blackman — Crimson magenta with white collar

Magpie — Rosy purple, edged white, with a white collar

Nightingale — Orange, overlaid crimson red, with a yellow collar

Pilot — Purplish crimson with a pure white collar

Rosette — Cerise, edged cream, with a white collar

Strathmore — Peach blossom, flushed yellow, with a cream collar

Woodpecker — White banded and tipped red with a yellow collar

BEDDING OR MIGNON VARIETIES

Ada — Pure yellow

Albion — Pure white

Avondrood — Orange

Benbow — Bright rosy crimson

Coltness Gem — Rich crimson scarlet

Dazzler — Bright orange scarlet

Empress — Rich rosy purple

Jubilee — Pink, suffused white

Julius — Bright rosy scarlet

Lustre — Brilliant crimson

Meta — Buff, suffused red

Mincio — Soft clear scarlet

Faisley Gem — Orange scarlet

Rose Coltness — A very fine variety

Zulu — Rich maroon

Chapter Fifteen.

THE ORCHID.

THIS plant requires protection from dry and scorching winds and should be grown in a conservatory or other shady place that is sheltered.

Orchids are terrestrial and epiphytic or parasitic. The former are grown in shallow pans or rustic baskets; the latter are preferable for many reasons and are ornamental. The substances used to fill these baskets are rotten wood, charcoal, sand, leaf mould, broken bricks and kunkur with a little loam. The larger the plant the rougher the materials for the compost should be. The epiphytic orchids thrive best when attached to the stems of trees or branches cut off with the bark on them, on which they must be tied with wire, and the roots covered over with moss.

The use of soap and water to cleanse their leaves cannot be too highly recommended. When they are growing they require a plentiful supply of water; and when in a state of rest they must have very little or none, unless it be those varieties that are evergreen. When they are in bud and flower they will only require moderate watering; this will be, with most varieties, after the end of February. When they have done flowering, the floor of the house they are in should be kept constantly watered so as to keep up a humid atmosphere, and the plants themselves should be watered twice a day. Even when

the plants should not be watered very much, watering the floor of the house they are in will not be found in any way injurious on hot days

Renanthera lindenii, *Angrecum Vanda* and *Camarotis* are propagated by division of small shoots thrown up round the old plants, which may be divided from them, or the top of the plant may be cut off below the first root, and these may be placed in damp moss or cocoanut fibre till they have started after which they must be treated as old plants. *Dendrobiums* are propagated most readily by removing the old pseudo bulb from the plants, either during their time of rest or just after flowering, and when they are beginning to grow. Be sure in dividing that the portion cut off has some roots attached to it. These should be potted off and no water given to them till they have begun to grow. *Stanhopeas*, *Epidendrums*, *Crælogynes* and *Cattleyas* may be increased by cutting them in pieces of equal lengths, and old stems having a few roots and a new bud attached to each piece. Such orchids as have only a single series of pseudo bulbs must be divided, but not removed till new bulbs have formed on the cut pieces, when they may be separated and potted. Some species propagate themselves by forming buds on the axis of their leaves. These buds in time send out leaves which may be cut off when they have in their turn formed leaves.

During the hot and dry months, the orchid house will require a cool or rather a mild atmosphere, this may be secured by "tatties" made of grass being placed opposite the windward side sprinkled with water. In hill stations orchids require heat. This can easily be done by placing a large common kettle filled with water on a brazier, and bringing it to the boil to raise the temperature. Every conservatory should have a thermometer in it.

It may be noted that the periods of growth and rest of the Orchid in this country are the same as in England.

The close of the season of rest is considered the best time for re-potting, just when they have started into growth; some gardeners consider the best time to be after the flowering season. In any case, previous to their being re-potted they should receive no water for a few days. After they are potted they should be elevated a little above the rim of the pot or basket, to allow the water to have a perfectly free passage.

Some kinds of Orchids grow best in moss alone, such as *Vandas*, *Aerides*, *Vanillas*, *Saccolabiums*, *Epidendrums*, *Nocturnum* and *Dendrobium formosum*.

The following calendar of hints should be a helpful guide to the amateur :—

JANUARY.—When plants show signs of growing, take precautions to make the necessary arrangements for shifting and surface dressing. The rotten wood should have boiling water poured over it to destroy all fungi and insects. If the temperature is below 50°F. heat is necessary.

FEBRUARY.—Growing plants must be put in the most conspicuous situations so as to be readily attended to. Water them slightly if they require it, and sprinkle the floors and walls frequently during the day, to retain a humid atmosphere. Destroy insects and shut up holes made by them with water and glue. If insects have injured any plant very much, dip it in gum and water, put it in the shade and after two days syringe and wash it with water at 100°F. The temperature during the day should not exceed 65°F. and at night not below 50°F.

MARCH.—Shift and surface dress those that have now started into growth. Use more water than was used last month on the floors and walls. Slightly water those orchids that may be in bud or flower.

APRIL—The atmosphere must be made as humid as possible by sprinkling water on the floors, walls, etc. The temperature should range from 65°F to 85°F. Syringe orchids in bud or flower, water those well that have finished flowering and shade from the sun.

MAY—Most of the orchids will be in flower. Preserve a very humid atmosphere and dip orchids in water of the same temperature as the house. Do not water plants, such as *Dendrobiums* with bulbs approaching maturity.

JUNE—Water all plants well that are growing freely and keep up a humid atmosphere. Withhold water gradually from plants reaching maturity and remove them to a cooler place, if possible.

JULY—Same as in June.

AUGUST—Some orchids will be inclined to rest now, such as *Dendrobiums* and *Epidendrums*, these should be kept cool and in a drier atmosphere to induce them to rest. Syringe liberally immovable and large plants, and dip baskets and portable blocks, once a week in tepid water, this applies to plants yet growing and for which a humid and warm atmosphere is yet necessary, such as *Lælias* and *Barbérias*.

SEPTEMBER—The temperature should be reduced a little now. Shade a little on very sunny days and water less, except those plants still in flower.

OCTOBER—Such plants as are yet growing still require water in quantities proportionate to their growth. Temperature should be from 70°F to 60°F if it is more than this the plants may shoot again and come into growth.

NOVEMBER—A drier atmosphere must be maintained to obtain rest for the plants for the next two months at least. Temperature from 70°F to 55°F. Stop dipping and only syringe.

DECEMBER.—Some plants may just be showing signs of growth; these must be placed in the warmest situations, and their growth must not be checked.

Dendrobiums are a very large genus of orchids, in which India is prolific. Many of them are most beautiful and well suited for the beginner to start with, as they are easy of culture and natives of a moist climate. Bengal suits them. Where westerly winds prevail the orchid house must have the side the wind comes from completely closed, or a "tatty" must be put up and kept constantly moist with water. The floors should be of sand and gravel, so that it can be constantly kept moist. It is best to have a small tank of water running the length of the house. In those parts of India where the climate is abnormally dry, it would be better, if possible, to have the orchid house underground.

Cælogynes are very handsome epiphytal orchid; mostly from the hills in India. Probably it is best to grow these generally in pots.

Phaius are terrestrial orchids, best grown in pots.

Epidendrums are a large genus, few of which are worth cultivating, being dingy in colour. Some, however, are more handsome, and some are grown for their sweet scent. Very few of these have been cultivated in India.

Cattleyas are a truly splendid genus, often producing flowers seven to eight inches in diameter. Closely allied to *Lælias*, from which it is distinguished by possessing four pollen masses. The flowers are produced from the tops of the pseudo bulbs, which generally have one leaf on them. They should be watered with a watering can in preference to a syringe, and should, when grown on blocks, be occasionally dipped in water. In India they are best cultivated in pots.

Lælias are known from *Cattleyas* by having eight pollen masses. They are best cultivated in pots.

Brassavolas are epiphytal orchids with large flowers. Leaves solitary and succulent.

Brassias are American orchids and are nearly allied to the *Oncidiums*. They are distinguished by the simple inflorescence, elongated tail-like sepals and short column, which is quite destitute of the side lobes or ears that form a marked feature in the species of *Oncidiums*. *Brassias* thrive in pots or baskets, the drainage being perfect, potted in peat broken up the size of walnuts, and well watered during Spring and Summer, and a little in Autumn and the cold season.

Oncidiums are known by the ears or warty crests at the base of the lip. The flowers are various in size and form, but in colour yellow predominates. They are epiphytal orchids, but grow well in pots or baskets. Some are found at high elevations, others in hot valleys. Some grow in the sun and some in the shade.

Angræcums belong to the tribe *Vandææ* and are epiphytal orchids, peculiar for the long hollow, tail-like spur hanging from the base of the lip. The flowers last a long time in perfection. They grow best in crocks, charcoal and moss at the bottom of the pot, and over that charcoal and crocks just sufficient to support the plant, then moss, well pressed down in a cone shape, to within a couple of inches of the leaves.

Cimbidiums are not attractive, though many of them are sweet scented.

Aerides are epiphytal orchids of the old world. Generally speaking they are of easy culture and almost all well worth growing. They should be first grown on blocks and then put in a pot filled with charcoal, potsherds and live moss. In the plains they may be freely watered from January or February right on to September.

Calanthes are terrestrial orchids mostly from India.

Vandas are very beautiful epiphytal orchids, natives largely of India and the Malayan Archipelago. Most of them are showy and fragrant. The stems are leafy with no pseudo bulbs. They require more light than most orchids, and many growers cultivate them in the sun, using no shade at all in England, but it is best to shade most of them for a portion of the day in this country on the plains. The lovely species, *V. Cœrulia*, requires less heat than the others, and *V. Teres* bright light, even sun, and lots of water when growing. The best mode of growing them is in a pot or basket with a branch planted in the centre of it among potsherds with a little moss. The *Vanda* plant is tied to the branch with copper wire.

Renantheras are plants that thrive well in Lower Bengal, and are grown tied on to a log placed upright in a pot. These are Chinese orchids and require full exposure to the sun. The pots should be filled with moss.

Bletias are a large genus of very pleasing terrestrial orchids and are easily grown when once thoroughly established. Their leaves are grass-like and their pseudo bulbs roundish or flattened. They thrive in a compost of loam and leaf mould.

Saccolabiums require the same treatment as *Aerides*, except that they are probably best grown in baskets or pots, and do not require much shade but lots of light.

Odontoglossums are American orchids of great beauty, but being plants that require a cool treatment, are not at all suitable to be cultivated in the plains of India. They are adaptable to cultivation in a conservatory in the hills. Those grown in a cool house do not require a resting season as a rule, and should be kept uniformly moist; they should not be exposed to direct sunshine in summer. Generally they grow best in pots or baskets, in a mixture of large bits of peat, charcoal with a little sand scattered in it and moss. The pots should be half full of crocks for

drainage. On the top of the pot after planting the orchid some fresh moss should be placed. Newly imported plants require hardly any soil, and should be put into small pots nearly full of crocks alone. They should on no account be forced by heat. Unless these precautions are taken the plant will start into growth rapidly, and thus be weakened and probably killed.

Cypripediums are one of the most important and interesting genera of all orchids. It is an admirable plant to cultivate, blossoming at different seasons. Their cultivation is not difficult and the compost consists of sand, peat, chopped moss and leaf mould with the addition of small pieces of brick and charcoal. They require partial shade such as a grass conservatory gives.

Stanhopeas are epiphytal orchids of America, with large flowers. The flowers do not last long, but they are free blooming, and some of them are very handsome. Some of them are powerfully perfumed. The plants should be grown in baskets, as the flowers are sometimes produced through the bottom of the basket, these baskets should therefore be made very open. Brick, charcoal and old leaf mould with a little chopped moss should be used to grow them in.

Vanillas are readily grown in pots with moss and potsherds well drained, with a branch for them to be tied on to.

Phalænopsis are very desirable orchids and grow well in a grass conservatory. The leaves should be kept particularly clean to ensure success in their cultivation. Most, if not all the varieties, are best grown on blocks of wood, on to which they are wired with a little moss. They are generally of easy culture.

The following is a descriptive list of some of the choicer varieties.

Dendrobium Amœnum, pure white, tipped violet, purple scattered all along the stem, violet scented; *D. Chrysotis*, golden yellow, lip orange with purple blotches, fringed; *D. Densiflorum*, in racemes of rich amber, lip orange, fringed; *D. Formosum*, white lip with orange throat, flowers very large; *D. Fytchianum*, white flowers in racemes nine inches long, lip three-lobed, purplish rose; *D. MacCarthiæ*, flowers large, about three inches long by three inches broad, in drooping racemes, rich cerise blue, lip lighter, scoop shaped, veined purple, blotched with a dark spot within; *D. Momiforme*, white, sparsely dotted purple on the lip and very fragrant; *D. Nobile*, flowers large, white tipped rosy pink, lips white, rosy pink in front, blotched at base deep velvety crimson; *D. Sanguinolentum*, flowers in bunches on the upper part of pseudo bulbs, amber, veined rose and tipped purple, lip large, point heavily marked purple; *D. Superbiens*, light purple, sometimes claret, shaded brown spikes, bearing from 8 to 12 flowers.

Cælogyne Asperata, pale cream coloured, lip marked chocolate, and yellow veins and streaks; *C. Cristata*, flowers fragrant, snow white, lip blotched yellow, veins golden fringed, pseudo bulbs smooth, shining apple green, somewhat oblong; *C. Odoratissima*, pure white, lip stained yellow, sweetly scented; *C. Speciosa*, flowers large, brownish or olive green, lip fringed, yellow, marked dark red and dark brown; *C. Wallichiana*, bright rose, lip marked down the centre white, sweet scented.

Phaius Albus, white, terminal drooping, in racemes, lip with a disc of yellow, veined rose; *P. Maculatus*, flowers yellow in great profusion; *P. Wallichii*, orange yellow or buff, tinged purple, lip yellow with brown throat.

Epidendrum Auranticum, bright orange, lip striped crimson, flowers produced from a sheath on top of the bulb; *E. Bicornum*, flowers purest white, lip with a few

crimson spots, spike from the top of the pseudo bulb, from 10 to 12 flowers

Cattleya Maxima flowers even rose colour of a pale tint, becoming deeper on fading, lip large, almost white, veined dark purplish crimson, centre streaked with orange, *C Mossiae*, very large flowered, blush or rose, lip large, sometimes frilled or crimped, *C Dodgsonii* is a very fine variety of *C Frianae* very large, lip deep crimson, throat orange yellow, *C Warscewiczii* purplish white, lip crimson, large, *C Gigas*, large, pale rose, lip rich deep purple or crimson violet in front, two yellow blotches at base, *C Leopoldii*, a variety of *C Guttata*, deep chocolate with dark red spots, lip deep rich red purple, flowers numerous and fragrant

Brassia Digbyana large flowers, creamy white, lip fringed and centre streaked purple, *B Glauca*, sepals and petals yellow, lip orange with a white throat

Brassia Lanceana, bright yellow, blotched brown, sometimes red, lip yellow, very slightly spotted and much waved, fragrant, *B Lawrenceana*, bright yellow, spotted cinnamon and green, lip yellow tinted green, *B Verrucosa Grandiflora*, greenish, blotched blackish purple, lips white and warty

Oncidium Aemulum, dorsal sepal cinnamon, lateral sepal yellowish brown, petals bright cinnamon, lip marked purple violet, yellow at base, *O Lanceanum*, very fragrant, vanilla like, yellow tinged green, thick and fleshy, barred and blotched chocolate brown, lip large, rich violet in lower portion, rose above, sometimes pure white, *O Macranthum*, golden, tinged purplish brown or purple red, petals often streaked crimson, lip fleshy with a crest of white, middle lobe yellow, lateral ones purple brown

Angraecum Caudatum greenish yellow and brown, lip white, spur greenish, thick, nine inches long, racemes about 12 inches long, *A Ellisii*, fragrant, white, spur pale brownish, six to eight inches long, racemes two feet

Cimbidium Elegans, flowers white, sweet scented; *C. Mastersii*, flowers white, sweet scented.

Aerides Crassifolium, purple dotted leaves, segments tipped purple; *A. Odoratum*, white, tipped pink, very fragrant; *A. Roseum*, rose with darker spots, lip bright rose freckled with a darker rose, racemes dense, many flowered, over a foot long; *A. Williamsii*, pinkish white, in great abundance, very pretty.

Calanthe Masuca, deep violet, lip intense violet purple; *C. Textori*, creamy white, flushed violet on petals, column, and base of lip.

Vanda Cærulea, when well grown five inches across, pale blue, lip deep blue, racemes 10 to 12 flowered or more; *V. Cærulescens*, mauve blue, lip violet and spur tipped green; *V. Cathcarti*, outside of sepals and petals white, inside yellow with reddish brown bands, lip white, streaked red at base; *V. Cristata*, yellowish green, lip buff, striped rich purple; *V. Insignis*, light brown, spotted chocolate internally, yellow white outside, centre of lip white expanding to purplish rose, racemes five to seven flowered; *V. Hookeriana*, white, tinted rose, lip white, spotted magenta purple, leaves erect, two to three inches long; *V. Parishii*, greenish yellow, spotted reddish brown, lip pale magenta with a narrow margin of white, striped orange; *V. Sanderiana*, pink, stained buffy yellow, lateral sepals pale nankeen yellow outside, greenish yellow within, reticulated crimson, lip pale reddish purple at base, tipped chocolate purple; *V. Suavis*, fragrant, large handsome flowers, white outside, spotted and barred blood purple within, lip pale rosy purple; *V. Vîpani*, white marked with short brownish purple lines, centre of lip olive green, sides yellow.

Renanthera Coccinea, blood red flowers in large panicles; *R. Loweri*, flowers of two kinds on the same spike, lowest pair tawny yellow enlivened with crimson

dots, the remainder pale green, almost hidden on the inner side by large irregular blotches of reddish brown. Spikes 6 to 12 feet long with 30 to 50 flowers, *R. Storiei*, orange, lower petals brilliant velvety crimson with small yellow bars, centre white.

Bletia Graulis pale greenish white, lip red and yellow, *B. Hyacinthina* flowers purple, racemose

Saccolabium Giganteum perfumed, white, in long, dense drooping racemes freely produced, spotted amethyst, lip mauve violet, *S. Curisfolium*, flowers cinnabar red, small, crowded in erect axillary racemes, *S. Mimatum* small, brilliant orange red flowers, *S. Retusum*, waxy white, spotted pink, *S. Turneri*, lilac, spotted, very beautiful, densely produced in racemes two feet long

Odontoglossum Cirrhosum, fine white, spotted deep purplish violet

Cypripedium Concolor, cream, finely speckled, borne in pairs on brown stem, leaves variegated, *C. Lawrencianum*, white with dark shining veins of purple, lateral sepals greenish white with dark purple spots, *C. Niveum*, snowy white, slightly freckled cinnamon

Vanilla Bicolor, very fragrant, dull red, lip cream, *V. Phalaenopsis*, bluish white, lip rosy blush outside, tawny orange inside

Phalaenopsis Amabilis, white, lip streaked with purple lines, lovely, *P. Schumannii*, leaves purple on the reverse, enormous spikes of flower, floriferous, *P. Reichenbachiana* large flowers in many flowered racemes, waxy greenish white with brownish markings, centre of lip mauve purple, sides orange and white, *P. Valenim*, purple, white at the base and having bands of purple, lip mauve, white and yellow

Chapter Sixteen.

FERNS.

THE different varieties of ferns furnish the most ornamental and beautiful foliage that our conservatories contain. As a rule they enjoy a moist atmosphere, shade, and a liberal supply of water. The soil they are grown in must be light and porous, absorbing what it can retain and allowing the remainder to drain off easily. The compost should consist of four parts of loam, four parts of leaf mould, and two parts of sand mixed with crocks or small stones. The pots must be well drained, covering the crocks with cocoanut fibre. Many kinds are hardy in India, and those ferns found in a temperate climate appear to flourish most luxuriantly in a tropical climate.

When ferneries are constructed in an open spot, they must have a grass roofing over them, so as to protect them from the sun, only allowing a little on them in the early mornings, for ferns grow more luxuriantly entirely out of the rays of the sun. Ferns should be syringed frequently; too much water cannot be used if the drainage is perfect; and of all things no dust should be allowed to accumulate on the leaves. As a rule, the more moist the climate, the more suitable it is for fern culture. In the dry climates of Upper India underground ferneries would give the best results. These should be constructed with a shallow tank running down the full length of its centre so as to provide a humid atmosphere.

Almost all ferns may be increased by division of the roots. Seed must be sown very carefully. Having prepared a pot with a very light, rather rough compost,

place it up to the rim in water till it is thoroughly wet, sow the fern seed thinly and cover with a glass. When the soil begins to get dry, do not water it from the top of the pot, but place the pot in water until the soil is wet. Another good way is to cover a brick with a little soil on which the spores may be sown, covering over with a thin layer of live moss. The brick should then be placed nearly to its surface in water in a pan which should be covered with a glass. When they have germinated they should be pricked off and transplanted into suitable mould. It is a good plan to avoid watering overhead. No hardy ferns should be syringed or watered overhead.

The following is a list of the various genus cultivated with success in various parts of India

Gymnogrammes, the silver and gold ferns, are very beautiful and valuable to our ferneries, none of which would be complete without them. Their sori arise from the underside of the fronds on the veins.

Notholaena have a silky or woolly surface and comprises about forty species. They should be grown somewhat elevated above the surface of the pot or soil in which they are placed. The fronds are better not wetted. The soil they are grown in should be fibrous loam mixed with pieces of sandstone and sand. Some of these are bulbiferous.

Polypodiums including *Aglaomorpha*, *Calymmadon*, *Campyloneuron*, *Phlebodium* and others are a most extensive genus. It includes plants of two modes of growth, each of which comprises a number of species and different kinds of venations. It is the largest genus of the order Filices, and comprises about 450 species from almost all climates. All have got rod-like stripes and fan-shaped palm-like foliage.

Cheilanthes are like the *Gymnogramma*, spoken of as gold and silver ferns, from the colours of the paste or ceraceous powder on the lower surface of their fronds.

Adiantum, or Maidenhair ferns, comprise some of the loveliest ornaments of the fernery. Graceful, delicate and feathery, they are hard to beat in decoration. A mass of *A. Farleyense*, one of the most beautiful of the species, growing luxuriantly with its refreshing green, is at once strikingly handsome, delicate and refined in aspect. The chief requirements in their cultivation is a compost of fibrous loam and sand, with plenty of pot room and good drainage.

Aspidiums or Shield ferns are hardy and require a cool climate. Some do not do well in the plains and are only suited to the hills.

Aspleniums or the Spleenworth ferns are a large and widely spread genus, which includes ferns that grow both in cool and warm temperatures. Their leaves are sometimes simple and sometimes divided. In the hills the following species can be grown:—*Negrum*, *Attenuatum*, *Ceterach*, *Augustifolium*, *Colensoi*, *Fontanum*, *Spinulosum*, *Trichomanes* and *Viride*. Those suited for tropical culture are *Abscissum*, *Belangeri*, *Baptissi*, *Circinatum*, *Fabianum*, *Ebeneum*, *Erosum* and *Umbrosum*.

Actinopteris or the Ray fern is a handsome genus with palm-like fronds. Perfect drainage is very necessary in their cultivation, and they thrive in a compost of crocks, charcoal in pieces about the size of a pea, sand, and a small quantity of loam.

Pteris are a handsome genus including almost every kind of division and venation. These are the brake or bracken ferns. *P. Aspericaulis tricolour* is a beautiful variety. The leaves when young are red and when matured are rich deep green with silvery markings, and the sides of the midrib are red.

Nephrodiums include the *Camptodium*, *Dryopteris*, *Lastrea*, *Plexnemi*, and *Sagenia*. Among them are some most beautiful species.

Davallia has prostrate or creeping stems covered with down. It is a lovely genus.

Alsophilas are chiefly tree ferns and are too large for most gardens

Lygodium is easily distinguished by their climbing stems, and the fronds, being permanent, interlace each other.

Gleichenias are exquisitely beautiful ferns whose stems generally creep. They have date palm-like fronds and are very pretty

Trichomanes are very delicate ferns. Almost all are suited to grow in warm or temperate climates. They are exquisitely beautiful. They should be grown in shallow pans or boxes, well drained, in cocoanut fibre, a little loam and sand, and about half the amount of potsherds and rubble. For the creeping species the soil should be raised in a mound and the atmosphere must be humid, they require much watering and syringing

Nephrolepis is a small genus, but very handsome and of easy culture

COLLECTIONS

An interesting selection is made up of—

Gymnogramme Calomelanus (silver), *G Massoni* (gold), *G Argyrophylla* (gold), *G Ochracea* (silver) *Notholaena Eckloniana*, *N Sinuata* *N Nivea* *Polypodium Wallichii*, *P Nigrescens*, *P Vulgare pulcherrimum* *Cheilanthes Cleavelandi*, *C Radiata*, *C Gracillima* *Adiantum Farleyense*, *A Amabile*, *A Candatum*, *A Digitatum*, *A Formosum* *A Monstrosum* *A Princeps*, *A Tenerum* *A Williamsii* *Aspidium Lonchitis*, *A Aculeatum* *Isplenium nigrum grandiceps* *A Baptissi* *A Nidus* *Pteris Aspericaulis tricolor*, *P Elegans*, *P Flabellata*, *P Serrulata* *Nephrodium Molle* *N Floridanum* *N Sanctum* *Darallia Fijensis* *D Elegans*, *D Pallida* *Lygodium Scandens*, *L Venustum* *Gleichenia Flabellata*, *G Discarpa*, *G Dichotoma* *Trichomanes Alatum* *T Pluma*, *T Vinosum* *Nephrolepis Duffii*, *N Pluma*, *N Tuberosa*

Chapter Seventeen.

THE VEGETABLE GARDEN.

THE Kitchen garden is usually relegated to a place apart from the Ornamental garden and is generally fenced off by means of a good hedge, which serves the purpose both of a screen as well as a protection from unwanted intruders.

A South Eastern aspect is to be preferred as the sun is more to the South in winter, and when the warm weather sets in, this position is more protected from the dry West winds so injurious to the proper growth of vegetables in the plains of Upper India.

The most convenient way of laying out the vegetable garden is in the shape of a square or rectangle, dividing it into various plots by means of paths, along the sides of which the main water channels can be run. The various crops then can be allotted to the different plots and rotation of the crops can be easily planned.

The preparation of the ground as far as the digging and manuring is concerned should be done during the Summer so as to obtain the full benefit of the sun's heat. Vegetables thrive in a fairly light soil or a good sandy loam, with a quantity of well rotted cow-dung and leaf mould thoroughly ploughed in. The use of liquid manure will be found of great benefit to the majority of crops and a good way of supplying this is to get a man to rub up cow-dung between his hands into the running water at the head of the channel.

Irrigation is a very important consideration and should be properly arranged for. It is advisable to have a well situated in the highest part of the garden so that the water can be conveyed, by a gentle slope, to all parts of the grounds.

It pays to get good seed, no good results can be expected from inferior seed. The seed should be fresh and when received should be kept as free from damp air as possible, to obtain this, use should be made of glass-stoppered bottles or air-tight tins. Seed beds should be carefully prepared with a free addition of sand and leaf mould and the soil well worked into a pulverized and friable condition before sowing. The soil should neither be too wet nor too dry, a good method is to water the beds a day before the seed is sown. In the case of early sowings during the rains, the seed beds should be raised about four to six inches from the ground or seed boxes may be utilized. The boxes should be well drained before filling with the compost. It is always desirable to make more than one sowing wherever practicable and the times given for sowing indicate the earliest and latest dates between which sowings can safely be made. In the hills seeds sown in the Autumn should receive protection from the cold.

The ground for all root crops should be deeply dug and it is advisable to grow these crops on ridges raised above the ground, especially in wet weather. It is not beneficial to transplant root crops, and when the seeds have germinated and the plants grown to their third or fourth leaf, they should be thinned out gradually to from 6 to 12 inches apart, according to the variety. This thinning out is essential and helps the roots to swell and develop. When it is desired to grow seed, the best developed roots are taken and the lower half cut away entirely, the top halves are then planted out in rich soil, where they will form roots and flower.

All vegetables of a climbing habit should have supports and this is of more importance during the rains, as any fruit lying on the ground is liable to rot.

The best vegetables for the table are those that are grown quickly and used while young and tender.

JANUARY.

In hill stations where the cold is not too great sowings of Radish, Lettuce, Cabbage, Broccoli, and Cauliflowers may be made in bottom heat, also Peas, Beans, Carrots and Potatoes. Parsley and Celery can be sown in boxes. Only small sowings should be made as it may be too cold.

In the plains remaining seedlings of Cauliflower, etc., can be planted out and those already out should be earthed up. More watering will be required. Small sowings of root crops, Mustard, Cress and Lettuce can be made.

FEBRUARY.

Small sowings of vegetables can be continued. Any seedlings should be protected from severe weather.

In the plains little can be done except watering, and small sowings of Lettuce, Mustard and Cress can be made.

MARCH.

In the hills most of the principal crops should be got in now. Too early for Celery in the open ground. Jerusalem Artichokes should be planted out now and offshoots taken from the Globe Artichoke. Early sowings must be made now and French beans may be sown at the end of the month.

In the plains collect matured crops and continue watering.

APRIL.

In the hills Jerusalem Artichokes and offsets of Globe Artichokes may be planted out. Put down main crop of

Potatoes Sow all crops and make sowings of Thyme, Marjoram and other herbs in boxes Tomatoes sown last week should be transplanted Application of liquid manure to growing crops

In the plains Asparagus need attention, watering and manuring Not much to be done except clearing ground which has been cleared of crops

MAY

In the hills watering and cultivation of the soil Rhubarb can be planted out Sowings of Parsley, Lettuce and Endive can be made Thinning out of seedlings

In the plains summer vegetables can be sown Maize, Brinjals, Squash, Cucumber, and Ladies Fingers Plant Jerusalem Artichokes

JUNE

In the hills lots of water required Plant out Celery Small sowings of Peas, Beans, Lettuce and Endive can still be made Plant out Vegetable Marrows, Capsicums, Pumpkins and Tomatoes, and sow Cress Sow successions

In the plains sow the country vegetables

JULY

In the hills sow Runner and Dwarf Beans Hoeing of growing crops Sowing of Carrots, Turnips, Lettuce and Endive for late use Sow Parsley for winter use Staking of Tomatoes and Beans Plant out seedlings

In the plains earthing up of Artichokes and sowings of country crops Hoeing Very small sowings can be made of Cauliflower, Brinjals and Cucumber

AUGUST

In the hills heads of Artichokes can be cut down and forked up Pinch Beans Sow Lettuce and a small quantity

of Cabbage and Cauliflower. Transplant any seedlings and take up matured crops, like Onions.

In the plains small sowings in boxes of Cabbages and Cauliflowers, also Celery and Asparagus. Preparation of ground.

SEPTEMBER.

In the hills plant out seedlings of sowings made in June and July. Sowings of Lettuce, Cress, Radish, Carrots and Turnips can be made. Onions can be sown.

In the plains sowings of winter vegetables can be made. Guard against rain and sow on raised beds. Preparation of ground by ploughing and trenching.

OCTOBER.

In the hills carthing up of Celery and the storing away of root crops. Prick out seedlings under a frame.

In the plains the main crop of all European vegetables should be sown. Successive sowings of Radishes, Lettuce, etc., must be arranged for.

NOVEMBER.

In the hills Asparagus beds should be cut down and manured. Store root crops. Blanching of Celery and Cabbage Lettuce. Stirring of soil around plants such as Cabbages and Cauliflowers.

In the plains sowings can be continued for succession. Plant out seedlings. Prepare deeply all ground to be occupied by crops.

DECEMBER.

In the hills Rhubarb can be forced and Endive blanched. Import seeds for next season's sowing.

In the plains sowings can still be made of English kinds but is rather late for Cabbages and Cauliflowers, but Peas, Beans, Lettuce, Mustard and Cress and Radish can be sown. Asparagus and Squash require watering.

ARTICHOKE

Vernacular name *Hatichuk*

The Globe Artichoke is propagated from seed. It is preferable to sow freshly imported seed, although acclimatised seed give very good results, but show signs of degeneration after two years. They can also be propagated by suckers, which is the only method by which the different varieties can be reproduced true to their former character. In the hills the Artichoke goes on living, thriving and bearing for many years in succession.

In the plains the seed can be sown at any time between August and the middle of October and in the hills from the beginning of March to the end of May, a later sowing can be made in September or early October. One ounce of seed is sufficient for 80 feet of row. It is a good plan to raise one-half of a plot from seed and the other half from suckers, the suckers flower sooner and the advantage gained is a crop of flower heads three weeks or so earlier than when only seedlings are used. Suckers should be separated from the old plants in September, and if not transplanted annually to a fresh plot of ground the flower heads decrease in size. To get a regular supply, when cutting the heads, the stems should also be cut close to the ground, new suckers will then appear, and if duly thinned, will produce a late crop.

The Artichoke requires a very rich soil to grow to perfection in, and lots of water. It is usually grown in trenches, which have been deeply dug and manured. The seed are sown in nursery beds, and when the seedlings are about four or five inches high they should be carefully taken up and transplanted into the trenches, at about three feet apart. Liquid manure may be used with benefit and the application of silt to the soil at the time of preparation is advantageous. The surface soil should be kept constantly stirred.

The Jerusalem Artichoke is grown from tubers and thrives best in a soil which is light and not very rich. In the plains the tubers can be planted during April and May and in the hills during March and April. The ground should be deeply dug and the tubers planted about 18 inches apart in rows. The tubers should be treated like potatoes, and after the plants die down, they can be taken up and stored for future use.

ASPARAGUS.

Vernacular name : Palagras.

This plant is usually propagated from seed which, in the plains, may be sown from September to November and in the hills from April to May. Acclimatized seed usually stays good for a couple of years. One ounce of seed is sufficient for a bed of four square yards. It grows well in a highly enriched soil.

The seedlings, when strong enough to handle, should be transplanted into prepared trenches, filled with a quantity of sand, leaf mould and cow-dung, with a layer of broken bricks underneath to ensure drainage. Salt used as a manure is of immense benefit, and a little sprinkled on the surface of the trenches and watered in will yield good results. For the first two or three years the plants should be allowed to grow and throw up as many shoots as possible; too early cutting is the chief cause of failure.

After four years' growth the plants will be ready to get suckers from. The plants should be cut down to the ground, the surrounding soil weeded and the whole line covered with a compost one and-a-half feet in height. This compost must be rich, and if salt is included, all the better. Suckers will grow up and as soon as they show about four inches above the raised soil, they should be cut off, carefully removing the soil round each.

Regular watering is necessary to success, and to strengthen the plants it is advisable to remove all flowers that appear.

BEAN

Vernacular name Sem

Under the head of beans there is a large variety, the European kinds being sown in the Autumn and the indigenous kinds in June, the latter coming into bearing before the former. Beans require a soil that is not too rich



DWARF FRENCH BEANS

and generally it is preferable to sow in one line only. Overwatering must be guarded against and the surface soil should be kept well hoed and pulverized. To prolong the period of bearing, the pods should be gathered before the seeds begin to harden.

The Broad bean known as the *Bakla sem* can be sown in the plains during October and November and in the hills from the beginning of March to the end of May. One pound of seed is sufficient to sow 80 feet, and the seed should be 15 inches apart in the row. The flowers set best

when the tips of the shoots are nipped off when in full bloom and the plants should not be allowed too many shoots. When the plants are growing they need earthing up and while in pod require regular watering. To obtain late crops the plants should be cut down to within a few inches off the ground after the main crop has been gathered, and given a good watering. Young shoots will be thrown out which eventually will furnish a fair crop of late beans; this method is preferable to late sowings.

The French or Kidney beans can be sown in the plains from August to the middle of October and in the hills from April to the middle of June. Four ounces of seed, sown at six inches apart, should be sufficient for a row 80 feet in length. They should be sown in a moderately shaded situation and in a well-drained soil.

The Runner beans are all more or less tall climbing plants requiring supports and sown at five or six feet apart. The Scarlet Runners do splendidly in the hills where they should be sown from April to June; in the plains sowings may be made any time from August to October.

The Sword bean or *Bara sem* is a climber and requires very little attention once it commences to grow. It does not succeed at very high elevations and can be sown from April to June and is in season during October and November.

The indigenous French bean, known in the vernacular as *Ghiya* or *Makhan sem*, is sown both in the plains and the hills during May and June. There are numerous varieties, the chief difference lying in the shape and texture of the pods; preference being given to the smooth skin varieties.

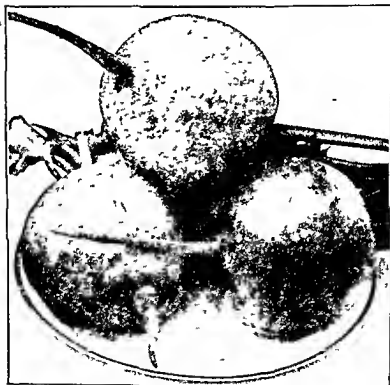
The Goa bean or *Char Koni sem* bears a peculiar four-sided pod, frilled as it were at the edges. It is not grown in the hills, and in the plains the seed are sown during the rains.

The Asparagus bean or *Lobia* is a climber and is sown in the plains in June and July. It does not succeed at high elevations, but if sown in the hills during April and May, a warm sunny part of the garden should be selected.

BEET

Vernacular name Chukunder

Acclimatized seed of the Beet usually shows signs of deterioration after four years, when fresh seed may be



SUTTON'S GLOBE

imported. In the plains it is sown from the middle of August to the end of October and in the hills in March, April and May. One ounce of seed is sufficient for a row of 50 feet. The Red beet is the most desirable for the

table, although there is a white variety. Beet enjoy a humid soil and when weeding, care should be taken not to break the leaves, as this is injurious to them. They are best grown in an open situation.

BRINJAL.

Vernacular name : Baingan.

In the plains the Egg-plant is grown to perfection, but is not grown at high elevations. There are many varieties differing in size, shape and colour of the fruit. Some of them are mainly ornamental and the purple coloured kinds are preferred for the table. It is usually sown two or three times during the year, in the early Summer, in the rains and about the middle of October, and in this manner the vegetable is generally in season throughout the year. To obtain handsome well-grown fruit, a certain number only should be allowed to remain on each plant, proportioned to its strength. The ground in which they are grown should be well prepared and highly manured and the seedlings transplanted at 18 inches apart.

BROCOLI.

This is one of the many subdivisions of the Cabbage family and succeeds well in this country in a soil that is the richest description of leaf mould. In the plains it can be sown in September and October and in the hills from March to May; a later sowing can be made in October, but the seedlings will require protection. The Brocoli attains greater perfection in the hills. The seedlings should be transplanted into rich ground at about 18 inches apart.

BRUSSELS SPROUTS

This is another subdivision of the Cabbage and needs a rich soil. In the plains the seed should be sown during September and October and in the hills in March and April. As soon as the second set of leaves has matured is about the best time to transplant into beds heavily manured with vegetable mould and a little old cow manure. The soil should be stiff, rich loam, into which the manure is mixed. When the plants show signs of sprouting and have reached their full height, which is known by the top head beginning to cabbage, this head should be cut off, by which operation the whole strength of the plant is thrown into the sprouts. The plants should be two feet apart in the field and require earthing up as they grow and a liberal supply of water.

CABBAGE

Vernacular name Bund Gobi

The Cabbage in its numerous varieties may be sown in the plains during September and October and in the hills from March to May, an Autumn sowing can also be made but will need protection from the cold. They require a very rich soil and should be transplanted two or three times before being put into their final position in the field. In the plains the earlier plantings should be done on ridges to avoid being swamped out during heavy rain. A quarter of an ounce of seed will be required for eight square yards. Acclimatized seed deteriorates after three years. The best manure suited is nightsoil, failing which, goat or sheep

manure is highly recommended. Enormous heads are sometimes grown by opening out the roots to the depth of three or four inches when the plants are about half grown and exposing them to the sun for a couple of days. A compost composed of equal quantities of old sheep-dung, loam and mustard-cake should then be filled in and the plants well watered. When cutting a cabbage the head should be removed just at the neck, leaving a few of the bottom leaves; the plants so cut will make another break and become furnished with a whole cluster of young succulent heads which are fit to cut before the large heads are all quite finished. The Savoy cabbage is an excellent type with crumpled leaves and compact, dense heads and stands the heat of the plains well. The Sugar Loaf varieties are so called from their conical head. The Drumhead is another fine variety and is particularly sweet. The Red Cabbage is only used for pickling.

CAPSICUM.

Vernacular name : Mircha.

Of this there are many varieties cultivated extensively throughout India. The large fruited kinds are called Capsicums and are mild in flavour; the smaller kinds are called Chillies and have generally a very pungent flavour. Among the former there are some very ornamental varieties, and besides being used for pickling, are sometimes grown as pot plants for decoration. In the plains they can be sown from April to June and about the same time in the hills. Any good soil suits them and the plants,

when transplanted to their permanent quarters one-and-a-half to two feet apart, require very little after-attention except weeding and regular watering

CARROT

Vernacular name Gajur

There are three sorts of Carrots, the long, the short and the blunt rooted. They are best sown on ridges and should be thinned out eventually to about six inches apart



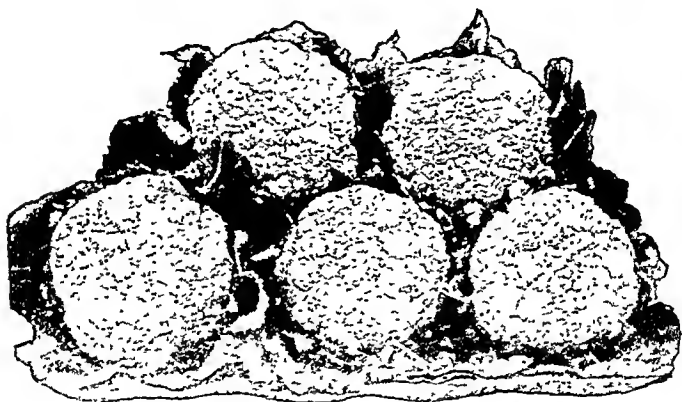
EARLY GEM

About one ounce of seed will be required to sow a drill 120 feet in length, the seed are light and very slow in germination, they are sown in the plains from August to November and in the hills from March to May, and also in Autumn. The soil should be light and sandy and not too rich, otherwise the roots are apt to fork

CAULIFLOWER.

Vernacular name : Phool Gobi.

This highly prized and popular vegetable is raised in the plains both from acclimatized as well as imported seed, sowing the former at the beginning of the monsoons and the latter in October; in the hills only imported seed is used, sowing in March and April, and also in Autumn. The cauliflower is very prone to deteriorate and acclimatized seed will not be much good after three or four years. Half



CAULIFLOWER.

an ounce of seed will be needed to sow eight square yards and will give about 800 plants, the seeds germinating within a fortnight. The seed bed should be prepared with a large quantity of leaf mould and well pulverized. Frequent transplanting is beneficial and those plants which have germinated first will be the strongest. The soil for the plants must be richly prepared, well supplied with leaf mould and deeply dug, and the plants put down in rows two-and-a-half feet apart; when planting out, the leaves should be cut back to about half their length. When cauliflowers have headed they may be blanched by tying a few leaves over the flower; this will also prevent them from running to seed too soon. To delay the formation

of heads so as to get a succession, as soon as the small flower heads have formed, the soil should be removed from around the plant to the entire depth of the root, leaving the plant as it were with only a ball of earth round the roots, and watering withheld. When required for use water may be applied. This method may also be used to delay seed formation. Young plants are sometimes attacked by a small caterpillar and later on by green fly, especially when the plants are seeding. Covering the leaves with ashes will keep away the caterpillar and spraying with a weak solution of phenyle will destroy the fly.

CELERY

Vernacular name Shalari

These are moisture loving plants and the place selected to grow them should be close to the water supply. Half



SOLID WHITE

an ounce of seed will be required for eight square yards and should be sown in moist soil, sowing in the plains in September and October and in the hills in March and April, also in Autumn; the earliest sowings will generally be found the best. The seed takes a long time to germinate, sometimes from four to six weeks. When the seedlings are large enough they should be transplanted into trenches very highly manured with a large quantity of cow manure and a little leaf mould mixed with some sand to a depth of a foot or more; on this about four inches of good loam should be placed and gently firmed down; in this the seedlings should be placed about a foot apart. Celery should be nearly full grown before earthing up is begun; this blanching should be commenced at least a fortnight before the plants are required for use and must be done gradually. Celery should be watered most generously every third or fourth day, and being a gross feeder and great exhauster of the soil, it will prove very beneficial to water with liquid manure at least once a week. There are two sorts of Celery—the red and the white—and of each there are numerous varieties.

The Celeriac is a form of Celery with a turnip-rooted stem, which is the part eaten. It is cultivated in the same way as Celery but does not require earthing up.

CHERVIL.

This is an aromatic sweet herb used for flavouring while the leaves are young. In the plains it can be sown from October to February and in the hills from March to August. It requires a moderately rich soil.

CRESS.

Vernacular name: Halm.

The garden cress is easily grown in any soil enriched chiefly with leaf mould. In the plains sowings can be made from September to February and in the hills from March

to September. It is grown for garnishing and the leaves are ready for cutting a few days after sowing. One ounce of seed is sufficient to sow three square yards.

Water cress may be grown either by seed or by division of the old plants, planted in any water course, and thrives best if a little gravel is mixed with the soil where it is sown. Half an ounce of seed is enough to sow three square yards. In the plains sow in October and November and in the hills from March to June. The bed should be made of light porous soil by the side of one of the main channels used for watering the garden. Until the plants have become fairly strong the soil should be kept well saturated, but later an opening into the bed from the main channel should be made and water allowed to flow in whenever possible, there should also be an opening at the other end to allow the water to flow out again.

CUCUMBER

Vernacular name Khera

Cucumbers from imported seed are difficult to rear in India as they are too delicate for open air culture in this country. In the plains the seed can be sown from the



RIDGE CUCUMBER

beginning of March to the end of July and in the hills the same period will do. A light rich soil is the best, mixed with stable manure or cow-dung. The seeds should be sown about a foot apart in rows and when the plants begin to grow they should be staked. The young plants are sometimes attacked by small red beetles, but this can be avoided by scattering wood ashes over the leaves.

The Gherkin, or *Gol Khara* of the natives, is a variety of the cucumber and is not commonly grown in the hills. It is a hot weather crop and should be sown during March and April in the plains.

ENDIVE.

Vernacular name : Kasnee.

In the plains the seed can be sown during October and November and in the hills during April and May, in a soil of brick-dust or gravel. The seedlings should be planted out in a moist position about 18 inches apart. The soil should be well enriched with cow-dung and plenty of leaf mould, and frequently watered with liquid manure. When of the proper size for use, the plants should be tied up pretty firmly, so as to admit of their being blanched. Before tying up the plants, care should be taken that the leaves are perfectly dry. A flower-pot should then be placed over them till perfectly blanched and fit for use. Blanching takes about a fortnight and too many plants should not be operated on at the same time. There are two kinds of Endive, the broad-leaved and the curled-leaved, and of each there are several varieties.

FENNEL.

Vernacular name : Saunf.

This is a common garden plant cultivated for its leaves and in certain parts of India for the seed. In the plains sow in October and November and in the hills during April

and May. The plants are easily grown in any good soil and require very little after-attention bar an occasional weeding and watering when the weather is dry.

GARLIC

Vernacular name Lason

Garlic is commonly cultivated throughout India, the root is made up of several cloves or separate small bulbs. In the plains these cloves are planted in October and in the hills in April. The cloves are separated and planted about six inches apart in sunk beds, so as to allow of irrigation. The soil should be of a light nature and fairly rich. The crop should be ready to take up by February when the leaves are seen drying off. Then water should be withheld for some days and the roots dug up, dried in the sun and stored.

GINGER

Vernacular name Adrakh

The tubers are planted both in the plains and the hills in May and are planted in rows about a foot-and-a-half apart and three or four inches deep, in a light rich soil. As it grows it should be slightly earthed up and the earth round the roots should be well cultivated and dug, so as to be loose and allow of the expansion and growth of the tubers. The soil should be well manured with leaf mould, especially if it is of a stiff nature.

HORSE-RADISH

This is propagated by root cuttings and is most easily cultivated in the hills. Each cutting about an inch long should be planted in deep, rich, rather moist soil well manured with leaf mould. In the hills they should be planted in the Spring, but it is not usually cultivated in the plains. Here an excellent substitute is found in the roots of young trees of *Moringa pterygosperma*.

INDIAN CORN.

Vernacular name : Bhutta.

The Maize is of easy cultivation requiring a moderately rich soil, well dug some time previous to sowing. A succession may be kept up by planting at almost any time of the year in the plains, provided the plants are irrigated if sown during the dry season. In the hills sow from May to June. The finest Indian Corn seed is got from America. The seed should be sown a foot-and-a-half apart each way and the plants earthed up when growing, to prevent them being blown over by the wind. The best manure is bone-dust and some old cow-dung if the soil is poor. Acclimatized seed give better results than freshly imported ones.

KNOL KHOL.

Vernacular name : Gant Gobi.

This is a form of cabbage with a turnip-rooted stem and is one of the earliest of European vegetables to be in season. In the plains it can be sown from the middle of August to the end of October and in the hills during April and May. A second sowing can be made in the Autumn. A light soil should be used to raise the seedlings and when large enough they should be transplanted into very rich soil, about 15 inches apart. The plants must be watered freely and the roots must not be earthed up, and the soil kept free from weeds and stirred up. There are two sorts of this vegetable—the Purple and the Green—both very much the same except in colour.

KARELA.

There are two distinct varieties of this bitter gourd, the hot season variety and the rainy season variety. The fruit of the former is smaller than the latter, which grows to about seven or eight inches, otherwise they are the same in appearance and covered over the whole surface with blunt

tubercles. In the hills it is not generally cultivated except at low elevations and in the plains the seed can be sown from March to the end of July. Requires a light rich soil.

LADIES FINGERS

Vernacular name Bhindi

There are several sorts of both the tall and the dwarf varieties, generally the dwarf kinds, being the earliest, are preferred. The seed should be sown both in the hills and the plains from March to June, in any soil, in drills, two feet apart. The pods should be used when not too old, otherwise they become stringy. They are of easy cultivation but require frequent watering when the weather becomes dry.

LEEK

Vernacular name Gunduna

In the plains the seed may be sown from the middle of September to the end of October and in the hills from March to May. The seedlings should be transplanted into beds richly manured with cow-dung and wood ashes largely mixed with sand to a depth of at least six inches. When transplanting care should be taken not to injure the young roots as this would hamper growth. They require a great deal of watering and the soil should always be well stirred up. If the top of the leaves are cut off occasionally, it will induce the roots to swell and they are much improved by the moderate use of saltpetre.

LETTUCE

Vernacular name Salad

There are two distinct sorts of Lettuce—the Cos and the Cabbage—the former being of more erect growth than the latter, but are treated in the same way. In the plains seed may be sown from August to the end of November.

and in the hills from January to August. The seed are very minute and one ounce contains about 28,000 seeds and a quarter of an ounce is sufficient for four square yards. The finest leaves are obtained from plants which have not been transplanted. They require a light well drained soil, well enriched with leaf mould and lots of water. Liquid manure is of immense benefit. The plants can be assisted to form heart by tying the outer leaves together; this will also be found useful to blanch the leaves. A certain number of varieties never form a head, but compensate, as it were, for this by producing a great abundance of leaves, which grow again after being cut, thus furnishing a large supply of green vegetables in a limited space.

LUFFA.

Vernacular name : Jhinga Tori.

The seeds are sown in the plains and at low elevations in the hills just before the rains set in. It will grow in any soil but is all the better for being lightly manured. The variety called *Ghiya Tori* has a smooth skin, but is cultivated and used in the same way.

MARJORAM.

Vernacular name : Marra.

Sweet Marjoram seed are sown in the plains in October and in the hills from March to June. There are other varieties, the common Marjoram, the pot Marjoram, and the winter Marjoram, which is a perennial. They can all be grown from seed and require a rich soil.

MELON.

Vernacular name : Karbuza.

Usually not grown in the hills; in the plains the best time to sow the seed is during the month of February. There are numerous varieties differing in quality in different

localities. A sandy soil richly manured is the best in which to grow them. Holes should be dug four feet apart, and after filling them with prepared soil sow the seeds, two or three at a time, in each one, after germinating all but the strongest should be weeded out. The fruit is considered ripe when the stems begin to wither. Imported varieties are better than the country ones. While the plants are in flower water should be withheld, but again applied when the fruits form until they are just ripening.

The Water Melon or *Tarbuza* is sown and grown in the same manner and fine fruit are produced from richly manured soil. The plants should not be pinched or stopped, the produce being always better the more freely the plants are allowed to grow.

The *Phoot* is a variety of the common melon and so is the *Kabri* so commonly used in a young state for salad like the cucumber.

MINT

Vernacular name Podina

Mint is usually planted in October by breaking up the old plants, in the hills this being done in the Spring. It wants a rich soil and a somewhat shady position. It grows for years in the same situation but is better if taken up annually and replanted in rich soil.

MUSHROOM

The Mushroom has not been very commonly grown in this country, the chief reason being the difficulty experienced in cultivating it. In the hills the spawn may be sown any time from March to October and in the plains from July to March. A cool dark godown should be selected and a bed about three feet broad made by the collection of fresh horse droppings, to a height of about three feet. After the bed is made it should be allowed to ferment for about a fortnight and the spawn may be

planted when the temperature of the bed cools down to about 80 degrees. The "brick" should be broken up into small pieces and inserted in the bed about 15 inches apart, covering the whole with a layer of earth about an inch thick. Generally a crop appears within two months of the date of spawning. If the surface soil becomes very dry, luke warm water should be applied by means of a watering can, using a fine rose. There are various ways by which an edible mushroom may be told from a poisonous one. The former are generally white or light coloured and do not change colour when cut. Poisonous ones usually grow in clusters in dark, damp places and are usually brightly coloured.

ONION.

Vernacular name: Piyaz.

The Onion seed deteriorates very quickly and should be sown as fresh as possible and as soon as obtained. A light soil is decidedly the best. In the plains the seed may



SELECTED AILSA CRAIG.

be sown in October and November and in the hills in April and May. When transplanting care should be taken not to cover the portion which will form the bulb and the soil should be kept well pulverized. One ounce of seed is sufficient to sow nine square yards, and as germination is delayed it is better to soak the seed in hot water for a couple of hours before sowing. Onions should be taken up when their leaves show signs of withering, when water should be completely withheld for a few days before they are removed for storing. To obtain young onions throughout the year, plant out old and worthless ones any time after June. For seed raising the upper third of the bulbs should be cut off and the remaining portion planted in good rich soil.

PARSLEY

Vernacular name Ajmud

This herb thrives in any soil in a shaded situation. In the plains sow from September to November and from March to May in the hills and protect from the rain. The curly leaf varieties are the best and should be planted in rich soil manured with cow-dung and leaf mould.

PARSNIP

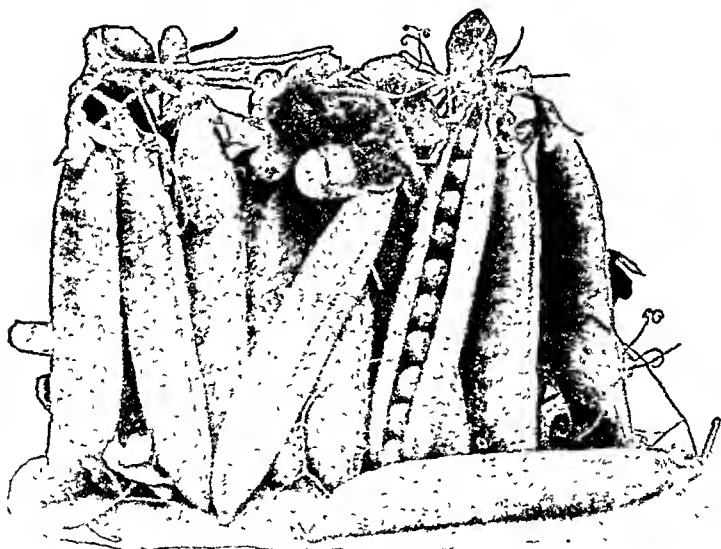
Vernacular name Gazur

The soil which suits the Parsnip best is one of a light nature and sandy mixed with cow-dung and stable manure. The ground should be well and deeply dug and in an exposed position, as it does not like shade. The seed can be sown in drills and then thinned out. Requires lots of water. In the plains seed can be sown in October and November and in the hills in April and May.

PEAS.

Vernacular name : Matar.

Of Peas there is an endless variety of both tall and dwarf kinds, as well as a sort of which the entire pod is eaten. They are easily acclimatized and do not deteriorate for years, and like a soil of a light nature manured chiefly with leaf mould and a little cow-dung, together with a small quantity of bone-dust and wood ashes. In the plains



SUTTON'S PIONEER.

they are sown in October and November and in the hills from March to May, and another sowing can be made in the Autumn. Half a pound of seed will sow a row 50 feet long. Peas are shallow-rooted plants and require manure on the surface of the soil. Germination is hastened by soaking the seed in hot water before sowing. The rows should be five feet apart for the tall kinds and three feet apart for the dwarf kinds. They require staking and the crop is increased if the leading shoots are pinched after the flowers have appeared. They do well in a partially shaded

part of the garden. When gathering the pods a pair of scissors should be used to sever them from the plants, to pull them off is to injure the soft shoots and perhaps the whole plant. Some very good varieties to grow are C's Telegraph, C's Model Telephone, Exhibition, Early Sugar Luscious, Quite Content, Diamond Jubilee, Duke of Albany, Gladstone, Earliest of All, Ne Plus Ultra, Autocrat and Duke of York.

POTATO

Vernacular name Aloo

This is undoubtedly the most valuable edible tuber our gardens possess and amongst vegetables the most generally



BEN LOMOND

consumed. The most desirable soil is a light one with old stable manure, wood ashes, lime and bone-dust well ploughed in. Guano is a good artificial fertilizer applied

at the rate of ten tons to the acre. Potatoes should never be grown in the same soil two years in succession and require an open situation. Propagation is done by means of tubers which, in the plains, are planted from the middle of September to December and in the hills during March and April. After the ground is prepared the tubers are planted, either whole or cut according to their size, about 24 inches apart. As the plants grow they should be earthed up and a good crop depends on this being carefully done. Water should be applied sparingly and after each watering the soil should be well loosened. The crop reaches maturity when the haulms begin to wither and dry up, at which period watering should be withheld altogether. In many districts two crops are raised during the year.

PUMPKIN.

Vernacular name : Kaddu.

Pumpkins flourish in a rich soil and should be grown over a trellis or outhouse, during the rainy season, to avoid the fruit rotting. In the plains seed can be sown from February to July and in the hills from March to June. There are many varieties, only differing from each other in size and shape and the colour of the skin, which ranges from greenish white to brownish red. The hot weather sowings should be freely watered and the ground kept free of weeds as far as possible. When the flowers do not set the ends of the vines should have their tips pinched off; as a general rule it is better to pinch off the tips as soon as the flowers appear. When very large fruit are desired, only two or three should be left on each plant, the best being selected; and the branches should be cut a few leaves beyond the last fruit. The readiness with which the stems of Gourds take root may also be turned to account, by covering those stems which bear the finest fruit, here and there, with soil at the joints, where they soon strike roots, especially if watered now and then.

The Bottle Gourd or the *Lauki* is sown in the plains from March to July and in the hills in April and May. The fruit is greenish white in colour and bottle shaped.

The Snake Gourd or *Chachinda* is sown during May and June and is not grown at high elevations. The fruit is green with greyish green stripes and is coarse flavoured.

The *Palwal* is sown from May to July and the fruit, only about four inches long, is of a pale green colour when young.

RADISH

Pernacular name Muli

Like all root crops Radishes require a deeply dug soil well enriched with stable litter. The seed should be sown in drills and later thinned out to about six inches apart. In the plains the seed may be sown at intervals from August to January and in the hills from March to August. In Upper India the sowings made in October turn out the best for the table. They require lots of water and the soil should be kept constantly weeded. The country kinds are inferior in quality, and one of them, the Rat-tailed Radish, is cultivated mainly for its pods, which are cooked and eaten. To obtain seed the October sown roots should be treated in the same manner as Carrots.

RHUBARB

The cultivation of the Rhubarb is a failure in the plains, but if crowns are obtained from the hills they may be forced during December and January. In the hills seed may be sown in March and April, and again in October. Rhubarb will grow without forcing, but better results are obtained when this method is employed. A large pot should be placed over the crowns in December and the pots should be covered over with a compost of old dung.

and litter, in a condition to maintain moderate heat, to a thickness of about three feet from the ground. It requires a heavily manured soil and is usually two years before the crowns are strong enough to bear cropping.

SAGE.

Vernacular name : Systee.

In the plains sow in October and in the hills in April and May. In making sowings of Sage, the plants should be shaded from the sun and rain till they are strong enough, and then may be gradually exposed. They may be saved through the rains if well protected. Requires an open situation and a well-drained sandy soil.

SALSIFY.

This plant is not commonly grown in this country as imported seed is very uncertain of germinating: acclimatized seed should be sown. In the plains, sow in October and in the hills in March and April. The ground should be deeply ploughed and well broken up and the seed sown in drills and thinned out to six inches apart. Treatment much the same as for Carrots.

SEA-KALE.

This does not succeed well in the plains, where it perishes on the approach of the hot weather, but like Rhubarb, may be forced in December and January if crowns are obtained from the hills. In the hills seed may be sown from February to April, and again in September and October; quicker results are, however, obtained if propagation is done by division or cuttings of the root. It enjoys a rich light soil in which leaf mould is largely incorporated. When large enough the plants may be blanched by means of inverted flower-pots.

SHALLOT

Vernacular name Ghandan

This is a useful esculent of the Onion tribe requiring a light and fairly rich soil. The cloves are planted out in the hills from March to May and in the plains in October. The soil should be kept loose so as to give the bulbs room to expand and grow freely. When the bulbs are matured they may be dug up and stored like Garlic.

SPINACH

Vernacular name Palak

In the plains the seed can be sown from September to November and in the hills in March and April. It requires a shaded situation and should be sown in drills and thinned out to about six inches apart. Successive sowings should be made as it is a crop that quickly attains maturity and any garden soil will suit it if well manured. The outer leaves only should be gathered, and those in the centre left for future pickings, by this method the plants last out much longer and yield much more than they would do if the centre leaves were picked at once.

The New Zealand Spinach is a hardier variety but considered inferior.

The *Lall* or *Marsa Sag* is a summer season spinach and may be sown during April, May and June.

The *Poi Sag* is another summer season spinach and is a climber. There are several varieties, but the white stemmed kind is the one most commonly grown.

The *Parsilane* or *Kulfa Sag* is a dwarf creeping herb and is sown from March to June.

SQUASH.

Vernacular name : Kumra.

This vegetable grows well in any ordinary garden soil and planted in pits in a compost of cow-dung and leaf mould. In the plains the seed may be sown from February to the middle of April and in the hills from March to the middle of June. They are grown in much the same way as Pumpkins. There are many varieties, some requiring support and others none.

SWEET POTATO.

Vernacular name : Sakarkand.

Both cuttings of the creeper, and more often tubers, are planted to propagate the Sweet Potato, and this is easily accomplished during the months from March to July. The cuttings are simply stuck into the ground about two feet apart; the tubers are planted at the same distance. A light sandy soil, not too richly manured, suits it best. There are two varieties, one with red tubers and the other with white tubers; the latter being considered the better of the two. They are easily grown without any great care.

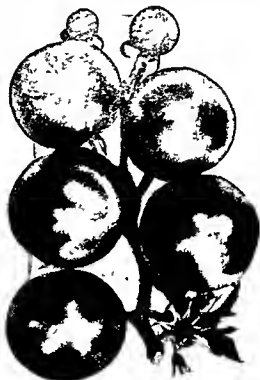
THYME.

This herb is sown in the plains in October and in the hills from March to May. It is usually only cultivated at high elevations as it is not able to withstand the heat of the plains, where a certain amount of success may be obtained if the plants are grown in pots in a shady position. It likes a light, friable, well-drained soil with regular watering when the weather is dry.

TOMATO

Vernacular name Bilatee Baingan

The Tomato requires to be grown in an open situation as light and air are essential to the production of sound fruit. Acclimatized seed remains good for about five years and should be sown in the plains from July to October and



TOMATO

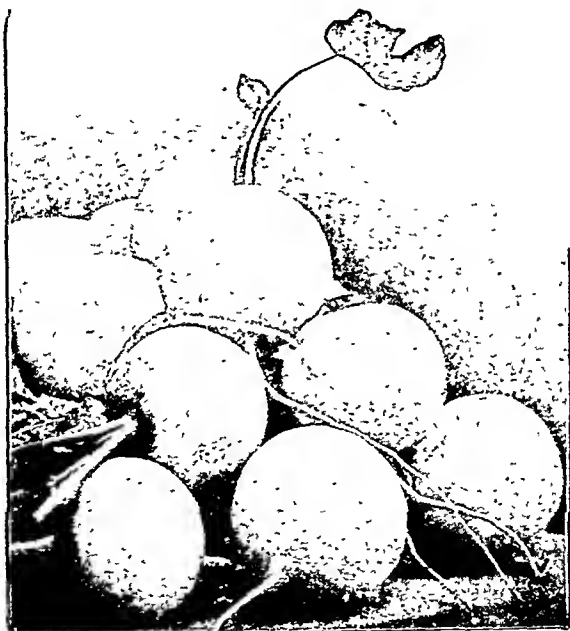
in the hills from March to May. There are numerous varieties in cultivation differing in size and shape and in colour from scarlet to yellow. In cold districts the plants require protection from frost. Tomatoes are usually of a straggling habit and it is better to grow the plants up a trellis work, and all superfluous growths should be removed.

The seedlings should be planted out in rows three feet apart and 18 inches between plants in a light sandy soil enriched with stable manure.

TURNIP.

Vernacular name : Shalgam.

Acclimatized seed of the Turnip can be sown in the plains from July to September and imported seed during October and November; in the hills from March to June.



SUTTON'S EARLY SNOWBALL.

They should be grown on quickly or else they acquire a strong flavour. Like all root crops they flourish in a well manured, friable loam. The seed is sown in drills and thinned out to nine inches apart. The turnip requires copious watering.

YAM

Vernacular name Ratalu

The Yam is not extensively cultivated and is propagated by cuttings of the main root planted out in prepared pits enriched with decomposed manure, this planting is done in the early Summer months. Being extensive climbers the vines require support, and when grown in trenches the vines may be allowed to ramble over the ridges.

Chapter Eighteen.

THE FRUIT GARDEN.

DURING the past decade great strides have been made in the improvement of fruit-growing both for the market as well as for home consumption.

Like other things the cultivation of fruits require careful study; the experience of others together with practical knowledge telling for success. Reliable information regarding cultivation, suitable varieties, etc., can always be obtained from the various gardens maintained by the Government in many parts of the Provinces.

The indigenous fruits of India are very few indeed and, barring the Mango, are of not much importance; the large majority of the cultivated fruits have been introduced. The location of the orchard is an important factor in fruit cultivation; a Northern aspect being the best, especially on hill sides. Ordinarily the orchard should be protected by a wind-break and Mangoes are as good as anything for this purpose. One of the chief aims governing the layout should be to afford means for subsequent tillage and two of the most satisfactory systems are based on squares and triangles. The former system consists of planting the trees at the intersections of equidistant straight lines crossing each other at right angles and the latter method disposes of the trees in equilateral triangles; this method is much the better of the two. The greatest care should be exercised in giving sufficient room to the trees to grow to their full size and allowing the sunlight and air to have full play

amongst them. Mixed planting is to be avoided and is only allowable in the case of slow growers, such as the Mango, where quick growers like the Papaya or the Peach may be grown between. Holes for the reception of the trees should as far as possible be prepared during the previous Summer, for the intense heat of the sun has a wonderful effect on trenched soil, where possible it is desirable to trench the whole ground. The holes should not be less than three feet wide and three feet deep and as far as practicable the top soil should be kept separate from the subsoil.

Tillage is the stirring of the soil for the direct purpose of benefiting the plants by improving the physical condition of the soil and is of supreme and greater importance than manuring, the necessity for which is comparatively only a recent idea. Thorough cultivation is the best remedy against drought directly determining the need for irrigation and is often a substitute for it. Green manures, such as lucerne and cow pea, should be ploughed into the land and are the only weeds which may be allowed to grow in the orchard. Manures should never be put in direct contact with the roots. Nitrogenous manures increase foliage and an excessive supply retards fruiting and tends to reduce their keeping qualities, this is balanced by the application of phosphatic manures and are desirable for young trees and those that are not fertile. The formation of the framework and tissues of the trees is aided by manures containing a large proportion of potash and lime, this latter is required more by stone fruits than by pip fruits. Chemical manures should only be used as stimulants, they must only be considered as auxiliaries to organic manures. To promote fruitfulness a mixture composed of one pound of superphosphate and one pound of potash may be applied to each tree and to increase growth two pounds of superphosphate, one pound of sulphate of ammonia and half a pound of sulphate of potash to each tree. It will not harm a tree in good health to apply a compost composed of one

pound of superphosphate, half a pound of sulphate of ammonia and half a pound of sulphate of potash. It may be considered a general rule never to stimulate the roots until the blooms have appeared. Although exposure of the roots is largely practised it should generally be resorted to only as a last resource, to induce fructification, as digging up the soil around the roots and manuring is usually quite sufficient.

Great care should be taken when planting and the roots should not be exposed to the sun and air longer than is necessary; damaged roots should be cleanly cut off and the remainder spread out equally, putting the strongest roots on the supporting side and the soil gradually filled in. Numberless trees are ruined by deep planting and this is an evil to be avoided.

Most fruit trees are benefited by pruning when in a condition of rest. It leads to the attainment of strong-bearing wood by adding to the health and strength of the tree and regulating the effect of air and sunlight, and largely influences the tree to retain its crop. The falling of flowers and immature fruit is mainly caused through the lack of fertilization. Weather conditions, such as prolonged cold, rain, an extremely moist atmosphere and a lack of sufficient sunlight have much to do with the dropping of fruit. Drought is probably the cause of fruit dropping when they have attained a fairly large size and often the quantity and kind of fertilizers in the soil is a deciding factor, *e.g.*, trees growing in soils deficient in potash are prone to lose part of their load. At the same time it must not be forgotten that it may be a distinct advantage for a tree to drop a part of its crop if it bears more fruit than it can bring to maturity, and this is where the artificial thinning of a crop is of distinct advantage.

Fruits develop best in dry weather, and as heavy rainfall is detrimental to ripening, any varieties that fruit

during the monsoons should not be selected for cultivation. Generally with regard to imported fruits the earlier varieties do better in India.

The distribution of parasites is largely determined by climate and an enormous number of insects are kept down by the hot winds of the Summer months.

THE ALMOND

Vernacular name *Badam*

The Almond is largely cultivated in Afghanistan and likes a warm sub-tropical climate. There are two varieties, the sweet and the bitter, and of the former there are thin skinned and thick skinned types. It prefers a warm, dry soil, deeply cultivated and rich in lime. Grafted plants are preferable to seedlings and the Peach stock is best for moist localities and the Almond seedling for dry localities. The best time for planting is during December and January and the plants bear when about ten years old. The flowers appear in February and March and the crop ripens during September and October. When planting, the trees should be put out at 15 feet apart.

THE APRICOT

Vernacular name *Khubanee*

The Apricot flourishes in hill localities and when well cultivated and planted in rich soil, bears excellent and well-flavoured fruit. All straggling branches should be shortened at the approach of Winter, at the same time applying a top dressing of manure to the roots. The early fruiting varieties are only suited to India, as the wet season is not conducive to the formation of good fruit. Water should be freely applied when the fruit is swelling.

THE APPLE.

Vernacular name: Seb.

The Apple grows and fruits well in the hills in the yellow or chocolate coloured loam to be found in those localities. It responds to an application of good decomposed manure and does not require any special attention, bar watering in dry weather, until a year after planting, when pruning will be necessary; this should be performed in the Autumn on the approach of Winter. Propagated by grafting, using the Crab or Paradise as stocks. There are numerous varieties but a selection should be made from those that are able to withstand the monsoons, that bear heavy and solid fruit, and that have a tendency to toughen and not soften.

THE AVOCADO.

The Avocado is a salad fruit and is acclimatized to India. It bears fruit in August and September of the shape of a large pear, with a seed in the centre about the size of a large marble. It may be propagated by seed or by cuttings of half ripened wood. Of late years propagation by budding has been successful.

THE BERRIES.

The Berries, including the Blackberry, Dewberry and Raspberry, are indigenous to the hills and do best in a moist soil, and given an annual top-dressing of manure in the Autumn. The best time for making a new plantation is in October or November in deeply trenched and well-manured soil. They are propagated by division of the roots and the plants should be transplanted into fresh soil every three or four years.

The Blackberry differs from the Raspberry in the fruits not separating from the juicy receptacle. The fruit is

borne upon one year old canes which should be removed after fruiting

The Dewberry is of a trailing habit but otherwise is hardly distinguishable from a blackberry

The Raspberry bears long shoots or canes in Spring which yield fruit in the Summer. All o'd shoots should be cut down to the level of the soil every year and the young growth of the following season allowed to bear the fruit. The fruit of the Raspberry readily separates from the receptacle when ripe

THE CERIMAN

This is not a fruit plant that can be counted on for a regular crop but is more of a delicate auxiliary to the fruit garden. It is known under the Latin name of *Monstera Deliciosa* syn *Torneha Fragrans* and flourishes in a very light sandy loam which contains an abundance of humus and succeeds best in a rather well-drained and shady position. The best way of propagation is by cutting the trunk into segments and allowing them to stand in the shade for a few days before planting in sandy soil. For fruit production it should not be allowed to reach any support which will enable it to grow more than a foot or two from the ground. The fruit takes many months to ripen from the time of blooming, but when it does, it is of delicious flavour, the ripening being shown by the lower portion becoming yellow. The fruit is rather juiceless and contains minute black spines which sometimes cause a disagreeable itching in the throat.

THE CHERRY

The Wild Cherry grows well in the hills, but there are also some excellent varieties in cultivation. It does not succeed at elevations lower than 3,000 feet. The blooms of most varieties appear rather early in the season and

are not infrequently injured by frost; this sometimes happens with the fruit as well. A rather light, well-drained soil suits it best and beyond very slight pruning in Summer, thinning out the branches and manuring, it requires little care except protection from the frost.

THE CUSTARD APPLE.

Vernacular name : Shareefa.

This tree is found in a wild state in many parts of India but is much improved by cultivation. It should be given a rich sandy soil to grow in and copious watering while in fruit. The one disadvantage about it is the numerous seeds that the delicious pulp contains, and the day may yet come when this drawback will be done away with, at least to a great extent. It is easily propagated by seed, but grafted plants are very much better using seedlings as stocks.

THE DATE.

Vernacular name : Khajur.

Very many attempts have been made in this country to improve and extend the very limited cultivation of the Date palm. The Date is essentially a production of a warm dry climate and is a water-loving plant, and will ripen its fruit in localities where the Summer is both hot and dry and the Winter not too cold. Too much rain increases the humidity of the air and lessens the sun's heat and the effect at the time of flowering is to spoil the pollen and at ripening time to ferment the fruit; for its successful cultivation irrigation must be depended on and not rainfall. There are male date palms and female date palms and both must be growing in the same plantation for good fertilization. It is usually propagated by the suckers borne at the base of the stem of female trees from 10 to 12 years of age; the suckers should be at least three or four years

old and planted out in a sandy loam in the month of April. The pits should be dug out three feet deep and filled in with soil mixed with a large quantity of good farmyard manure and about six pounds of oilcake to each pit. The suckers should be planted so that the terminal bud is high and dry, as the bud will rot if water has access to it. Signs of growth frequently show in a month's time. Male plants are difficult to distinguish from female plants until they have flowered, but generally the trunk of the male palm is thicker than the female and the crown of leaves is denser.

THE FIG

Vernacular name Unjeer

The Fig is propagated by gootee grafting and by cuttings, the former being the better method and done during the rains. It flourishes in hill stations and is grown with a fair amount of success on the plains. With regular watering they do well in a compost composed of cow-dung, ashes, and other refuse with a sprinkling of lime. The watering should never be neglected when the fruit is ripening otherwise it drops from the tree. Another cause of fruits dropping is due to the roots reaching a bad subsoil, if the plants are young they can be replanted, but in the case of old trees root pruning must be resorted to. They should be put out at 15 feet apart and bear in from two to three years. All superfluous growths should be cut away and leading shoots pinched, this pinching is very important when the fruits are swelling to induce ripening and to help the wood to mature for the next fruiting season. A fully ripe fruit splits at the broad end and shows the red colour of the inside pulp, the skin is very thin and comes off with the slightest touch.

THE GOOSEBERRY.

Vernacular name : Tiparee.

This is a straggling plant which requires pinching to keep in bounds and also to help in the formation of large fruit. The seed should be sown in May or June and transplanted into rich soil at a distance of two feet apart.

THE GRANDILLA.

The Passion Fruit is a perennial climber and a native of Brazil. It is commonly cultivated in sub-tropical countries for its fruit, which is about the size of a hen's egg and of a purple colour when ripe. Being a climber it should be planted against a wall with a southern aspect, or over trees with not too much foliage. It is not very particular as to soil but responds to good treatment.

THE GRAPE.

Vernacular name : Angoor.

The Grape is a surface rooting plant and is propagated by cuttings of ripe wood obtained from the prunings of the season. The plants may be put out in a line, ten feet apart, along a wired fence so that the branches can be trained along the wires. Many gardeners are of the opinion that the roots of the vine must be exposed to allow of the wood ripening, but if there is any danger of this, withholding water will ripen the wood of the most vigorous vine; good strong manure forked into the border in December and January is better than exposing the roots. After the plants have formed, all young growth should be cut back to one or two buds. The fruit is produced on the growth of the season, which arises from wood of the previous season, and the bearing wood should be kept as near the original trunk or head of the vine as possible.

All fruit bearing laterals should be stopped at one leaf ahead of the bunch and should be done as soon as the bunch of flowers appear. The plants should be allowed to bear only a limited number of clusters and each cluster must be thinned out while quite small with a pair of scissors. All small and cross berries must be removed leaving the remainder about half an inch apart and all pointing outwards. The vine will bear fruit in three years from the time of planting.

THE GUAVA

Vernacular name Amrood

There are only two varieties of the Guava, the white fleshed and the pink fleshed, of these, the fruit assumes a diversity of shapes and sizes. The white fleshed varieties are preferred because they keep longer and contain a lesser quantity of seed. A rough method of recognizing a pink fleshed fruit is by the dull green colour of the skin, while the other is of a shining yellow when ripe. Guavas propagated by grafting yield much better fruit than seedlings. The holes dug for the plants should be manured with good cow-dung and castor-cake, and the plants put out in the rains at 15 feet apart. A peculiarity of the guava is that it flowers at any season of the year, but usually produces two crops a year, the Winter crop being better in quality than the monsoon crop. The trees will bear marketable crops after three or four years and no manure need be applied until after flowering commences. The trees require regular watering but should be given a rest before the fruiting season by withholding water and exposing the roots. The guava is generally free from any disease and the mealy bug appears to be the only insect pest attacking the fruit when quite small, discolouring the skin as a result.

THE LITCHI.

The fruit of this tree is as delicious as any in India and is borne in large bunches during April and May. The best quality fruits have very small seeds. They thrive best in a rich sandy loam in a moist situation. The Litchi is propagated by gootee grafting performed in the rainy season. It is to the good if the roots are exposed in the cold weather for a few days and then covered in with as rich a soil as possible. Copious watering should be made while the fruit are swelling to make for fine plump fruit.

THE LOQUAT.

This is a semi-tropical fruit, but excessive heat at the time of maturing fruit causes sunburn. The method of propagation carried on largely in India is by means of inarching during the months from March to July. The Loquat is not particular as to soil and does better when planted in a position that is protected from frost; this planting is done during the rainy season at a distance of 20 feet from plant to plant. No pruning is necessary, but it is advisable to practise thinning when the clusters of fruit are too heavy. Grafted plants bear fruit in about five years while seedlings take about 12 years. The roots may be opened out in December for a week. When the fruit are swelling water should be copiously applied.

THE MANGO.

Vernacular name: Am.

This is the most esteemed of the indigenous fruits and is found growing all over India. There are numerous varieties—both good and bad, some acid, some stringy and redolent of turpentine, while others are luscious, sweet, and with a firm jelly-like pulp that can be cut with a knife. Independent of the difference in flavour the varieties also

differ in their season of ripening, from May and June to late September and October. Propagation from seed is very simple and in Burma and certain parts of India, where the seedlings are said to come true to parentage, this is the method largely employed. Seedlings, however, take rather long to come into bearing, usually about 12 years. Inarching or grafting by approach, meets with general approval as giving better and surer results. Such plants bear fruit in about three years from the time of planting and are dwarf in growth. Seeds planted in June and July produce fine strong plants for stocks in a year's time, and as the mango seed rapidly loses its vitality, it should be sown as soon as possible after the fruit is eaten. In transplanting seedlings to pots, a process preceding grafting, about two-thirds of the foliage should be trimmed off and the tap root pruned back, this shortening induces the formation of a better root system which facilitates the final planting out. The most favourable time for grafting is during the rains.

The mango will grow in a variety of soils, but good fruit is produced in a well drained loam containing a small amount of lime. Holes 3 feet by 3 feet should be dug about 25 to 30 feet apart and, after being left open for some time, good rotted manure and fresh bones should be placed at the bottom of each and then filled up. Grafted plants are usually pot grown and may be planted out in February and March or during the rains, and require shading from the sun and in Upper India from the frost for the first one or two years. Abundant manure is necessary to induce rapid growth, and when the trees have grown up, an application every two or three years increases the yield. In some localities an application of about ten pounds of salt is made to each tree during the month of September to arrest the growth and encourage the formation of flower buds. In December the roots may be exposed for a couple of weeks and then covered with a compost of good soil, well rotted cow manure and ten

pounds of bone-meal for each tree. A good stimulant for old trees is made up of 5 lbs. of Superphosphate, 2 lbs. of Sulphate of Potash and 2 lbs. of Sulphate of Ammonia. Young trees need constant watering, and when the fruit appears water should be copiously given but withheld when the fruit is ripening.

Many people are aware of the familiar phrase, "a good mango year" or a "bad mango year"; this phenomenon is generally due to outside agencies, but most often to enfeeblement due to a heavy crop the previous year. The mango is an exceptionally healthy tree; few insect pests attacking it and no serious fungus. The worst insect pest is the "mango hopper," known as the "chaapee" in Northern India. These insects multiply in large numbers about the flowering period, from December to March, and destroy the major portion of the crop by sucking out the juices of the tender flower buds, resulting in a decreased yield and the shedding of unripe fruit. Their presence is easily felt when walking through a mango orchard, and should the trees be attacked in large numbers, the leaves are covered over with a shiny sticky juice. The breeding season is the time to destroy them and spraying with crude oil emulsion has proved successful.

THE MULBERRY.

There are two varieties, the black and the white. They are easily propagated by cuttings put down during the rains, and do better in the hills than in the plains. In the plains they bear fruit in February and March, and although the fruit is sweet it lacks flavour. The quality of the soil and the climate has a great effect on the quality of the crop. It prefers a rather dry climate and heavy rainfall does not allow of perfection. It requires a rich, somewhat sandy soil. The Indian varieties are largely grown for feeding silkworms.

THE ORANGE

Vernacular name Narungee

The Orange flourishes in a temperate climate with an average rainfall of about 50 inches. The site for an orangery should be open, high lying and thoroughly drained, the soil should be rich, friable and black, and there must be a good, open sub-soil of gravel. The orange is of slow growth and is a gross feeder, the quality and the flavour of the fruit can be largely influenced by proper manuring and the family thrive well in a soil that contains an abundance of lime and old brick mortar.

The orange is propagated chiefly by budding. The variety of stock best suited has been under discussion for some time past and various experiments have been carried out to ascertain this, but generally each district has its own particular stock which seems to be best suited to that locality. The many stocks used include the sweet lime, the pomelo, the *khatta* and the Jamberi or common citron. The seeds are taken from the ripe fruit and sown fresh during the months of November to January, germinating in about a fortnight's time, when about three or four inches high they should be transplanted into rich soil and again in the following October to about a foot apart. In about two years from the time of sowing the seed the plants will be ready for budding, which is done during November, December and January. The budded plants are ready for planting out the following August to 15 feet apart. The holes should be prepared during the Summer and allowed to remain exposed to the sun before filling in. Just before the rains a quantity of brick rubbish should be put into each hole and then filled up with a compost of good soil, cow manure, broken bones and a good sprinkling of lime. While the plants are young watering should be frequent, but later on a watering once

a week is sufficient. The soil should be frequently hoed and benefited by being topdressed at least once a year, applied in the rains at the beginning of the period of growth.

The orange blossoms twice a year, once in June-July ripening in February and March and again in February-March ripening in December and January. It is very necessary to give the plants a rest after they have borne fruit; irrigation should be discontinued and the soil round the roots dug out to expose them, covering again after about three weeks with soil and good decomposed manure and irrigating. The rest encourages the maturity of the wood and diverts the energy of the plant towards bud swelling and fruiting. The same tree should not be allowed to bear both crops. In five years from the time of planting the trees should be bearing a good crop and continue to do so for some ten years.

One of the chief diseases of the orange tree is the "Die back", a form of indigestion due to overfeeding with nitrogenous manures; the remedy is obvious. The borer grub bores into the stems; the collection of sawdust-like material indicates its presence and it should be expelled by pouring into the holes hot water and kerosene. Caterpillars should be picked off and destroyed. Black fly are easily got rid of by syringing with tobacco water. Scale insects and mealy bugs sometimes cause damage and spraying with kerosene emulsion is effectual in removing them.

The other members of the Citrus family require much the same treatment. The Citron is distinguished from the larger varieties of lemon by the leaves having no winged footstalks and is generally propagated on the lime or on the pomelo. There are three or four different varieties differing in size; one known as the Finger citron is irregular in form. The Kumquat or Otaheite orange is ornamental and the small fruit only used in preserves. Of

the Lemons and Limes there are many varieties, the former being propagated by budding and the latter by gootee or layer as well as by seed. Among the limes one of the best varieties is the "Kagzee," of the form of a hen's egg, and when ripe of a lemon yellow colour. There is a seedless variety in cultivation of a very much larger size and exceptionally juicy. The Pomelo is also known as the "Grape fruit," because its fruits are often borne in clusters, and is also sometimes referred to as the Shaddock. They love moisture in the soil and require copious watering when the fruit has set. A small quantity of salt should be mixed with the soil at planting time and may also be applied as a top-dressing. In January the trees should be pruned removing all weak and dead wood, and the roots should be exposed for a few days and covered in with a compost of soil, cow-dung, lime and salt.

THE PAPAYA

The Papaya is a tropical plant and does not prosper under any than tropical conditions, fruit produced at high altitudes or that produced during very cool weather is frequently inferior in flavour. There are three kinds of papaya the hermaphrodite, the flowers of which are perfect, the pistillate or female, and the staminate or male. Of the two fruiting kinds the hermaphrodite is preferable to the female one since it is usually sweeter and better flavoured and is more apt to reproduce itself true from seed than the latter. It is distinguished by its more or less oblong or pear shaped form, the female papaya has a more roundish shape, prominent nose and a large seed cavity that is frequently filled with seed. Changing the sex of the male has at times been brought about by severe pruning but cannot always be relied on.

The papaya is propagated by seed. In about a month after germination the seedlings should be large enough to be transferred to pots, in which they should remain for another month before being placed in the open ground.

Holes for their reception at a distance of ten feet from each other should be dug and filled with a mixture of good soil and decomposed manure. It has also been propagated by cuttings and grafting; the latter method is valuable in so much as it tends to prolong the life of the plant and such plants come into bearing rather quicker than seedlings. While the papaya will give good fruit with quite a limited supply of water, it responds freely to liberal irrigation on well-drained soils and under such conditions yields larger fruit and heavier crops. It has been noticed that plants growing on a soil containing old brick mortar and rubble or growing near the walls of a house are very much more vigorous than those growing in any other place. When the fruits are too close together they should be thinned out to allow of sufficient space for development; this thinning should be done when the fruit is young. The first ripe fruits may be expected about a year from the time of planting and thereafter flowers and fruit may be in evidence at all times of the year.

Insect pests give very little trouble. A tiny red mite occurs on the underside of the leaves and on the fruit, but does not cause much damage. Recently a disease attacking older trees has been investigated. It is known as "Foot rot" and occurs towards the base of the trunk. It appears mostly in the rainy season and the bark and inner tissues decay. This goes on until the tree falls down. If noticed in time the decayed portion should be cut away and the part washed with crude carbolic acid mixed with an equal quantity of water.

THE PEACH.

Vernacular name : Aru.

The Peach is cultivated in India with a great deal of success and are divided into Freestones and Clingstones, the former having a more or less pointed apex, smaller than the latter type, and grows more successfully on the

plains Besides the ordinary varieties, many European and American kinds have found their way into cultivation January and February are the best months for planting and any good, well-drained, friable loam will suit it, the holes should be prepared the previous season at a distance of 20 feet apart The peach is propagated by ring budding, using the peach seedling or the plum as stock, the former is to be preferred The stones should be sown in August or September and these will be ready to bud on by the following March or April The leading shoots of the seedlings are cut back to about six inches off the ground, the bark is then peeled back and a bud that has been cut and pulled off in a tubular fashion is fitted on and worked down till it firmly fits the stock The peach is pruned when it loses its leaf, and if the leaves do not readily fall, the roots must be bared in November and December, withholding water In any case it is a good plan to expose the roots for a few days in November and then cover in with manure Fruit is borne chiefly on the lower portion of the young wood formed in the Summer, so about a quarter of all wood should be cut away when pruning Copious watering should be given when the fruit is swelling In localities where the monsoons set in early only early fruiting varieties should be planted

The Nectarine is closely allied to the Peach but does not succeed in the plains It is cultivated in the same manner

THE PERSIMMON

This is a Japanese fruit imported into India and grows in the hills but does not do well on the plains It is better to import grafts and plant in a sunny situation in a sandy loam of open texture with a fair amount of humus and good drainage The flesh of most persimmons is

juicy when sufficiently mature and the fruit are very attractive in colour when ripe. The astringency in an unripe fruit is very marked and no attempt should be made to eat them till they are very soft.

THE PINEAPPLE.

Vernacular name : Ananas.

The Pineapple succeeds best in a light, open, sandy, well-drained soil of a loamy character in a moderately moist atmosphere with fairly heavy rainfall. Propagation is done by means of suckers which grow out of the leaf axils after the fruit is cut and these are planted out at two feet apart in the rainy season in well-manured beds. If the plants show a healthy growth but fail to fruit, the following mixture applied at the rate of four ounces to the square yard will be found useful. One part dried blood, two parts sulphate of potash, one part basic slag and two parts bone meal. Irrigation during the formation of the fruit will assist in the production of larger and juicier fruit, but water used in excess during the last stages of the ripening will produce a watery, insipid fruit.

THE PLANTAIN.

Vernacular name : Kela.

The Plantain requires abundant moisture and a well-drained soil, and thrives admirably in a moist warm atmosphere; it succeeds well under irrigation and should be planted in a situation protected from strong winds. Suckers should be planted out in the rains in good rich soil well manured with cow-dung and ashes. They should be large, from six to eight months old, having the first leaves narrow and sword-like. They should be cut back to within six inches of the corm; all the old roots removed and allowed to dry for some days before planting out at least ten feet apart from each other. Every effort must

now be made to keep the plants growing and in a thrifty condition, tillage is one of the important forces making for fine fruit. Too many suckers should not be allowed to grow from the parent plant and should be limited to one or two, according to the richness of the soil and the strength of the parent plant. After the fruit has set it is advisable to remove the flower bud, covering the cut surface with earth to prevent the loss of sap. As a stem only bears once it should be cut down to the ground after fruiting. There are numerous varieties and the "Champa", larger than the "Cheena champa", the "Martaban" and the "Ram kela" are amongst the good kinds.

THE PLUM

The Plum is not suited to profitable cultivation in the plains, where it seldom bears fruit in sufficient quantities but on the hills it is of the easiest cultivation and bears fruit in profusion. The early English varieties bear well, but the late varieties which ripen during the rains are insipid and watery. They do well in a soil that is not too rich. Plum trees bear chiefly on the small branches produced from the main stems and these should be thinned out in pruning. Pruning is done in November and December and all straggling branches should be cut back. At this time the soil can be dug round the roots and manured. The trees flower in March. Sometimes the crop set is too much for the tree and if good fruit are required then thinning must be resorted to.

THE PEAR

Vernacular name Naspati

Excepting the country variety whose fruit is on the whole of a coarse nature, the Pear does not generally bear on the plains of India, but flourishes in hill stations and other high elevations. The country pear is increased by cuttings, but the better varieties, many of them imported

from Florida, are propagated by grafting. The stock used is generally the Quince and is perhaps the best stock for most deep, stiff, moisture retaining soils, while the English Pear stock is most suitable for sandy, light, shallow soils in warm situations. The Pear fruits on spurs and these should be cut back at the time of pruning during the period of rest. It requires a moderately rich soil and thorough cultivation of the soil.

The Bihi or Quince can only be recommended for cooking. It is the chief stock used for the grafting of apples and pears. It bears fruit on the plains in some localities but is more suited to the hills where it thrives without any trouble.

THE POMEGRANATE.

Vernacular name: Anar.

The country varieties of this fruit are of no good quality and are grown more for ornamentation than for anything else. The Kabul varieties are the best and are largely imported into India. The Pomegranate requires a rather rich soil mixed with brick and rubble obtained from old buildings. The fruit has two drawbacks; one is its enormous quantity of seed and the other is its proneness to be attacked by worms. To avoid this the flowers should be sprayed with a weak solution of phenyle, say a table-spoonful to a gallon of water.

THE ROSELLE.

Vernacular name: Kudrum.

The Roselle is cultivated for the sepals of the flowers which are made into jam. There are two varieties, one red and the other white. The seed may be sown in March and April and the seedlings transplanted into good soil. The crop will be fit for gathering in the following October and November.

THE STRAWBERRY

Strawberries grow to perfection in certain localities of Upper India. They want an open situation and should be planted on ridges in a rich moist soil. All runners not required for propagation should be removed. It is difficult to keep the plants alive during the rains, so it is advisable to get fresh runners every year. These should be planted in September-October on ridges about two feet apart and fifteen inches from plant to plant. They require plenty of water during the growing period, and a sprinkling of Kamit at the time of planting or even as a top-dressing later will greatly improve the flavour.

Chapter Nineteen.

TIMBER TREES.

TO make a list of trees suitable for cultivation under all the circumstances and surroundings found in this vast country would necessarily be somewhat lengthy, so an endeavour has been made to only list those which are most suitable from a horticultural point of view. The same procedure has been followed with regard to shrubs and climbers.

The size trees should attain before being planted out depends very much on the situation in which they are to be planted. Generally the younger the better, as a tree kept for too many years in a pot before being shifted is apt to have its roots in a distorted condition. An exception occurs with trees meant for roadside planting.

The best time for planting is during the rains, but large trees are best transplanted during the cold season. A plant, when put out in the ground, must be given a good start. A liberal sized hole should be dug to receive the roots, and the soil well prepared and manured and worked in among the roots. In these circumstances the young plant will grow rapidly. It is a good rule to plant a tree no deeper than it grew in the nursery.

When newly planted evergreens shed their leaves the symptom is regarded as favourable; when the foliage shrivels on the tree the planter's hopes fall. The casting of the foliage indicates that the sap is circulating and the

tree making a serious attempt to accommodate itself to the new conditions

ABIES

The Himalayan Spruce (*A. Smithiana*) is a large evergreen, coniferous tree, with a tall straight trunk, common in the hills and associated with the Silver Fir and other trees. It is propagated from seed which ripens in October and November. It is a good roadside tree for high elevations. The Silver Fir (*A. Webbiana*) is a large evergreen tree with a dense crown of dark green foliage.

ACACIA

These are ornamental trees and large shrubs. The Babool (*A. Arabica*) known in the vernacular as the "Kikar", is a well-known tree with thorny branches and small golden yellow flowers. It is easily grown from seed which ripens in June-July. Where pruned, irrigated and properly attended to it makes an excellent hedge. *A. Farnesiana* is an ornamental shrub, with yellow, scented flowers and foliage similar to the common babool. It thrives anywhere with very little water. *A. Modesta* is a slow growing tree, but a kind suitable for sowing in dry situations. It is moderate sized with grey foliage and white scented flowers which appear at the beginning of the hot weather. This genus is not generally suited to the plains of India; they all require a sandy loam and perfect drainage.

ADENANTHERA

A. Patonina is a handsome tree, the flowers of which are white and yellow. When kept well trimmed it makes a pretty bush. Propagated by cuttings put down in the rains.

AILANTHUS.

The Tree of Heaven (*A. Excelsa*) is a large handsome deciduous tree, not unlike the Toon, for which it is often mistaken, and makes a fine avenue tree. It is propagated by cuttings and seeds which should be sown as soon as ripe. There is an allied species (*A. Glandulosa*).

ALBIZZIA.

These are large handsome trees and make beautiful specimens. *A. Julibrissin* is small sized with handsome red flowers and graceful foliage. The Siris (*A. Lebbek*) is a well-known large deciduous tree, with pretty, scented globular flowers which are succeeded by pods 10 to 12 inches long. It is a common roadside tree and is easily propagated from seed. The Safed or Dun Siris (*A. Procera*) is a white-stemmed tall handsome tree with yellowish or greenish bark. The seed ripens in April and should be sown at once. *A. Stipulata* has graceful, bright green feathery leaves.

ALSTONIA.

These are pretty trees with their deep green foliage which are evergreen. The Oleander-leaved Alstonia (*A. Nereifolia*) bears white star shaped flowers. Its leaves are somewhat broader than that of Oleanders and makes a pretty bush. *A. Macrophylla* is similar but has broader leaves. *A. Scholaris* has white salver shaped flowers.

AMHERSTIA.

A tree considered by some as the most beautiful in the whole vegetable kingdom. Its flowers are in large and pendulous clusters of red and yellow, and are really lovely. It is, however, far too tender to suit a hill climate. Propagated by layers.

ARAUCARIA

Trees of a most splendid genus, stately in their growth, and exceedingly handsome. Grown on a large lawn they are most ornamental, and many of them thrive in the plains, while all would grow in hill stations. All the varieties are handsome and make lovely pot plants, the best, perhaps, being *A. Excelsa*.

BARRINGTONIA

These are trees of considerable size and some of them are particularly handsome, especially *B. Racemosa*, a good sized tree which is of great beauty, but to view it in its beauty one has to see it in the early morning before its flowers begin to fall, as it is a night bloomer. The flowers are in long pendulous racemes on short stalks and bright pink in colour. This tree loves a damp situation and is best planted near a tank. *B. Acutangula* is another handsome tree, little if at all inferior to the last mentioned, and is known by some people as the Indian Oak. The flowers are in racemes 18 inches long, of a rose pink colour, with numerous long stamens. The leaves are serrated, about six inches long by two inches broad. It loves a damp situation. *B. Speciosa* has flowers of a deep rose or red colour.

BAUHINIA

Mostly small trees of an ornamental character and slow growing. The Kachnar (*B. Variegata*) is a moderate sized, deciduous tree, grown from seed which ripens in June or July. The flowers are red marked with white and yellow. *B. Alba* has beautiful white flowers. *B. Acuminata* has pendulous branches and whitish or pink flowers. *B. Purpurea* has red flowers, one of the petals being streaked with white. *B. Tomentosa* has pale yellow petals with a red spot.

BOMBAX.

The Simal or Silk Cotton (*B. Malabaricum*) is a large deciduous tree with a large crown, covered with large red fleshy flowers in February and March. A portion of the flower bud is eaten as a vegetable and the pod contains a silky fibre.

BREXIA.

These are small trees which are handsome for their foliage. Their leaves strike if placed in sand under a hand glass, or a leaf with a bud attached to it will grow. Their leaves are not unlike some of the rubber trees. In the plains they are usually cultivated in grass conservatories.

BROWNEA.

Trees or shrubs closely allied to *Amherstia*, and are of great beauty. They are propagated by layering. *B. Arisa* is a small tree or shrub of exceeding beauty, bearing enormous drooping heads of the richest scarlet flowers. *B. Coccinea* is similar but the heads of flowers are smaller. *B. Erecta* bears erect heads of rosy scarlet flowers. *B. Grandiceps* bears red flowers in immense heads, or rather spikes, in great profusion. *B. Macrophylla* has orange scarlet flowers in heads one foot in diameter.

BUTEA.

The Dhak (*B. Frondosa*) is a moderate sized tree, with a crooked trunk and few branches, bearing in March and April very handsome flame coloured flowers in brown velvety cups. It is easily grown from seed which ripens in June and July.

CASUARINA.

The well-known large Australian Beefwood tree (*C. Equisetifolia*) is grown more as a curiosity as it is leafless, but looks quite pretty and makes a good avenue tree.

CALODENDRON

C Capensis is a tall growing tree which is handsome for its flesh coloured or pink flowers, in large panicles. It is raised from seed or cuttings. It has never been successfully cultivated in the plains but does well in the hills.

CASSIA

There are a number of varieties but only a few deserve a place in the garden. The Amaltas (*C Fistula*) has undoubtedly the most ornamental character, and when in flower, in May and June, is a splendid mass of yellow. *C Javanica* has flowers of a deep rosy pink. *C Nodosa* has pink and white flowers, like apple blossoms. *C Simea* has yellow flowers.

CASTANOSPERMUM

The Moreton Bay Chestnut (*C Australe*) does not grow very well in Bengal but does well up-country. Its flowers are crimson and yellow. A large tree growing to 40 feet or more and exceedingly handsome. Propagated from cuttings of ripened wood placed in sand in the rains.

CEDRELA

The Toon (*C Toona*) is a large and remarkably handsome tree, with beautiful dark green leaves. It requires a rich soil and is propagated from seed which ripens in June.

CEDRUS

The Himalayan Deodar (*C Deodara*) is a large handsome tree common in the hills and suitable for roadside planting.

CERCIS.

The Judas or Love tree (*C. Canadensis*) does well up-country. They should be grown for their peculiar beauty, as their branches, when in flower, are covered with bloom, and the peculiar form of the leaves, which appear after the flowers, have a charm in themselves. The flowers are red. There is a variety (*C. Siliquastrum*) which bears bright purple flowers. These trees are generally raised from seed sown in the Spring and begin to bear flowers in their third or fourth year. The seed should be sown in light soil. They may be propagated from cuttings but plants from seed do best.

COCHLOSPERMUM.

The Yellow Cotton tree (*C. Gossypium*) is a handsome tree bearing fine large buttercup yellow flowers. It is propagated by seed.

COLVILLEA.

This is a tree 30 feet or more in height with showy bright orange coloured flowers and leaves resembling the Poinciana. It is propagated from seed.

CYCAS.

These trees are very beautiful, with leaves very much like small palms. They are exceedingly pretty on the lawn by themselves, either singly or grouped together. They do well in a plant house.

CUPRESSUS.

The Twisted Cypress (*C. Torulosa*) is a large ornamental tree propagated from seed. The Saru (*C. Semper-virens*) makes beautiful specimens on lawns. The Weeping Cypress is *C. Funeris*.

DALBERGIA

The Shisam or Sissoo (*D Sissoo*) is a rapidly growing handsome tree preferring a moist climate and a light sandy soil. Propagated from seed which ripen in December and January. *D Latifolia* has been called the Bombay "Blackwood" and is similar to the above.

DILLENIA

D Indica is a small but handsome evergreen tree with a short, erect, bulky trunk and leaves in large tufts. It often grows to 30 feet and over and bears white, very fragrant flowers, nine inches in diameter, with yellow stamens, followed by a round green fruit, the size of a pomelo or larger.

ERYTHRINA

These are pretty plants which grow in the open in the plains but require shelter in cold localities. They succeed well in any rich open soil composed of loam, sand and leaf mould. To obtain vigorous growth they should be well watered when growing. *E Blakei* has scarlet flowers and *E Crista Galli* crimson. The Indian Coral tree (*E Indica*) has brilliant scarlet flowers which appear when the tree is leafless. This is a fast growing tree in a damp climate.

EUCALYPTUS

The Eucalyptus is a native of Australia, which country is supposed to owe its immunity from malaria and its singular healthiness to this tree. There are possibly about 150 known varieties, of which there are varieties suited to every kind of climate met with in India. Some will stand moisture and will drain swamps, while others can endure the most arid regions. Failure to grow them satisfactorily is due, in most cases, to planting the wrong kinds. In growing Eucalyptus, well ripened seed should be sown in

pans and carefully watered. When about four or five inches high they should be transplanted to check the downward growth of the roots and encourage lateral rootlets. It does not stand transplanting when allowed to grow too big. The Blue Gum (*E. Globulus*), which has been mostly tried in India, is not suited to either extremes of heat or cold, but prefers a temperate climate. Eucalyptus suited to dry conditions are *Crebra*, *Longifolia*, *Melliodora*, *Pilularis*, *Rostrata*, *Rndis*, and *Tereticornis*. Those suited to moist or wet conditions are *Botryoides*, *Citriodora*, *Cornta*, *Rostrata*, and *Longifolia*. For ordinary conditions the following, *Citriodora*, *Corymbosa*, *Diversifolia*, *Globulus*, *Paniculata*, *Pnnctata*, and *Stuartiana*.

FICUS.

The Banyan or Bargad (*F. Indica*) is a large evergreen tree, with glossy dark green leaves and spreading branches, which in moist climates send down numerous slender roots that descend to the ground and later become trunks. Propagated from seed and cuttings. It makes an excellent avenue tree for shade. The Gular (*F. Glomerata*) is a middle-sized tree giving dense shade. The Pakar (*F. Insectoria*) is a large evergreen with glossy dark green leaves. The Pipal is *F. Religiosa* and is a well-known large tree with irregularly shaped trunk and wide spreading branches. *F. Retusa* is a fairly large tree with small dark green leaves and dense foliage. *F. Roxburghii* is a medium-sized tree, the fruit of which is eaten by the poorer classes.

GARUGA.

G. Pinnata is a moderate sized handsome tree, highly ornamental while in fruit. It is leafless during the hot weather.

GREVILLEA.

This is a very large genus, consisting of trees and shrubs, of which the following species grow readily in this

country, both in the plains and hills, and are very ornamental in foliage as well as bear flowers of more or less interest. *G. Banksi* bears flowers of a red colour in dense terminal racemes and grows to a height of about 15 feet. *G. Robusta* is a handsome tree, bearing orange coloured flowers and with pretty leaves silvery white beneath. *G. Hilli* is a lovely species of shrub with deep red flowers, yellowish at the tip. All the varieties are propagated from seed or by layers.

GUSTAVIA

This is a genus of handsome trees with very showy flowers. They require a rich loamy, rather moist soil, much the same as *Barringtonia*. Cuttings may be struck during the rains. *G. Gracillima* has rose red flowers, produced from the axils of the leaves in young plants and from the wood in old ones. *G. Insignis* and *G. Pterocarpa* have white flowers and would do best in a glass conservatory.

HAEMATOTOXYLON

The Logwood (*H. Compechianum*) is a small tree growing to about 12 feet in height, of slender form, leaves glossy, the whole tree is elegant, more so when covered with its small yellow flowers, which are fragrant.

JONESIA

J. Isoka is a highly ornamental tree which is found in many of the hilly districts of India. It bears flowers, not unlike huge trusses of *Ixora*. Nothing can be more handsome than this tree when it is in full bloom. It is easily propagated from seed which it bears in abundance.

JUGLANS

The Walnut (*J. Regia*) is a large handsome tree growing wild in the Himalayan forests but does not grow in the plains. It is propagated from seed.

KIGELIA.

K. Pinnata is an evergreen tree, with dark green foliage and dark liver coloured flowers suspended at the end of long rope-like stems. The fruit are cucumber-shaped and very large.

LAGERSTROEMIA.

The Jarul (*L. Flos reginæ*) is a handsome tree when in flower and prefers a moist climate. It is propagated from seed.

MELALEUCA.

The Cajeput oil tree (*M. Cajeputi*) is remarkably like a willow, both in foliage and in its graceful habit. Its branches droop with its foliage, which is of a greyish green colour, and when bruised emit the odour so agreeable and peculiar to Cajeput oil. This tree bears seeds which, when sown by hand fail to germinate, but self-sown seed around the tree come up perfectly well. The flowers are white like the Bottle Brush. Also known as *M. Leucadendron*.

MELIA.

The Persian Lilac or Bakain (*M. Azedarach*) is a moderate sized tree with handsome lilac flowers; it is highly ornamental and is propagated from seed ripening in January and February. The Nim (*M. Indica*) is a large evergreen valued for its medicinal properties. The seed ripens in July and August. It is very hardy and will grow almost anywhere. Gives good shade if watered, but is apt to lose its leaves during the hot weather, if not irrigated.

MESUA.

The Iron-wood tree (*M. Ferrea*) is a jungle tree of great beauty. The flowers are white, about the size of a sweet briar, and very sweet scented. The stamens of the

flowers are yellow and contrast beautifully with the white petals. The wood is prized for its extreme hardness. It is rather slow growing and is not attacked by white-ants.

MILLINGTONIA

M. Hortensis is a tall graceful tree with dark green leaves and clusters of white scented flowers. Although much planted as an avenue tree, it is not much suited for this purpose, as it is shallow rooted and is thrown down in a violent wind.

MILLETIA

M. Ovalifolia is a small handsome tree when in flower. Its large bunches of mauve-coloured, pea-shaped flowers hang down from pendulous branches in wonderful profusion.

NYCTANTHES

The Har Singar (*N. Arbor Tristis*) grows to about 10 feet in height and is sometimes rather unsightly from its bare woody stem being visible, but this should not be the case if the soil is well manured and the trees renewed every three or four years. It is propagated from seed most readily. The flowers are starlike and white, with orange centres, and are used as a dye by the natives. It flowers in great profusion, and the ground round the trees is regularly carpeted with fallen flowers daily. The flowers are very fragrant and the tree is of rapid growth.

PINUS

The Chir (*P. Longifolia*) is a large tree with symmetrical branches high up on the trunk forming a rounded head of light foliage. This is perhaps the only species that does well in the plains and is propagated from seed which ripens in October and November. The Blue Pine (*P. Excelsa*) is a large tree of bluish green foliage and is well suited for planting about a hill station on open well drained slopes.

POINCIANA.

The Gold Mohr (*P. Regia*) is a very showy tree with large bright scarlet flowers, which are a lovely sight when in bloom. It grows rapidly, but is liable to be broken by the wind. Easily propagated by seed.

POLYALTHIA.

The Asok (*P. Longifolia*) is a good-sized evergreen, handsome, shady tree with a straight trunk and long dark green glossy leaves. It grows from seed and thrives in stony situations. It is a good avenue tree but does not like transplanting.

ROUPELLIA.

The Cream-fruit tree (*R. Grata*) is so called from its agreeable scent. The corolla of the flower is white, tinged with purple, and is delightfully scented. It requires to be well cut in, if it is desired to keep it within bounds. Its young stems are reddish brown and has leaves nearly a foot long with red petioles. It is propagated from cuttings in the rains.

SARACCA.

Known in the Deccan as the Asoka, *S. Indica* is a handsome dark foliaged tree with yellow orange flowers. When young the leaves droop and are of a deep red colour.

STERCULIA.

These are handsome trees and make beautiful lawn specimens. *S. Colorata* is common and remarkable for its orange flowers, and is leafless during a certain portion of the year. The Deodar of Western India (*S. Fœtida*) is a very stately tree. *S. Villosa* is a good sized, handsome large leaved tree, with grey bark. Propagated from seed which ripens in April and May.

TAMARINDUS

The Tamarind (*T Indica*) is a well-known large handsome evergreen with a high, broad shady crown. It becomes a magnificent specimen when full grown and is easily propagated from seed.

TERMINALIA

The Bahera (*T Bellerica*) is a large handsome tree with a tall straight trunk and broad massive crown. The flowers have a strong offensive smell. *T Chebula* is a moderate sized tree, the dried fruits of which are the black myrobalans of commerce. Grows in a well-drained loose soil. *T Arjuna* has very graceful foliage.

WRIGHTIA

The Ivory tree (*W Antidysenterica*) has white sweet scented flowers borne in the hot season and *W Coccinea* has scarlet velvety flowers.

Chapter Twenty.

SOILS AND MANURES.

AS the site of the garden is regulated by the site of the house, the gardener in this country has frequently, if not invariably, to take the soil just as he finds it. Manure plays a very important rôle and its application in the correct kind and manner does everything to rectify any deficiency in the soil.

Manures are divided into two classes: Organic and Inorganic or Artificial. Most of us have to buy manure in some form or other for the garden, so it is very necessary that we should collect all that we can from our own compound. All leaves, ashes and such refuse should be placed in a manure pit.

Cow-dung is a good manure for general use and every bit that can be collected should be put into a pit and regularly forked and turned over and kept in a moist condition. Very often it is thrown above the soil in a heap and exposed to rain, sun and air, thus making it worthless. This manure is well adapted for applying to light soils and should always be used in a thoroughly decomposed condition. Stable litter is another useful manure and must also be used in a thoroughly rotten state. When collected in a pit it should be forked up every two or three days and never allowed to dry up. It is useful for stiff soils, and as it contains a large amount of ammonia, it is beneficial, when used in a liquid state, to Chrysanthemums in bud.

Oilcake is very energetic in its action and is a good manure for roses and for making compost for other plants. It should be broken up into small pieces and mixed with water, and allowed to decompose before being used. Wood and cow-dung ashes are stimulating to the growth of plants, making for large dark green leaves. The former ash is a very valuable manure but it must be sparingly used.

Night-soil, sheep and pig-dung are also valuable fertilisers and should be used whenever procurable. Guano, the dung of various sea-birds, is a very concentrated fertiliser and should be used in a liquid form.

Soot is useful as a manure, and when applied to soil infested with earthworms, kills or expels them. It is excellent when applied to pot plants. When applied as a liquid manure it drives the worms to the surface, when they can easily be destroyed.

Charcoal is a great help in potting plants. It has a wondrous charm for roots and is of the foremost importance in the soil of nearly all pot-grown plants. It is most useful when mixed with the manure heap, as it absorbs ammonia largely, and when applied to plants supplies them with it as well as with oxygen, which it also absorbs in a less degree. When mixed with the compost for pot plants it assists drainage and sweetens the soil.

The sweepings of the fowl and pigeon house are very valuable and must not be thrown away. It is a very concentrated manure, approaching in value Guano. It should be kept dry and not exposed to sun and rain. It can be applied as a liquid manure, or when powdered and mixed with dry earth it can be distributed over the surface of the soil.

In soils deficient in organic matter, no better form can it be supplied than in the form of green manure, which

is of a succulent nature, and which readily decays and becomes part of the real soil. Green manure crops differ from other field crops in that they are ploughed under before maturity is reached, and at such a stage of growth that the soil will be supplied with organic matter and nitrogen. Members of the leguminosæ family are usually used for green manure. They should be planted so as to allow of them being ploughed under several months before the ground is required, to give them time to rot. Leaf mould is a very valuable adjunct to all composts and in the preparation of seed beds, and all leaves should be collected in the Autumn and stored in a pit to rot.

Bone meal, though a slow acting manure, is very useful and should be mixed with the lower soil so as to give it time to decompose.

One of the finest ways of manuring plants is by means of liquid manure. The solid manure should be tied up in a sack and put into a barrel of water and allowed to soak for a few days. When required for use a quantity should be taken out and mixed with three or four times its quantity of water. When using liquid manure of any sort, it must be applied perfectly clear and weak; it is better to apply it frequently than to use it strong, as it will harm the plants. It should be applied only when plants are in vigorous growth, when plants are in bud or when plants in pots have become root-bound and it is desired to force them to flower. It is a beneficial manure for all flowering plants.

INORGANIC MANURES.

There are various artificial manures on the market, but these should never replace organic manures, but should only be used in conjunction with them.

Nitrogen is the most important plant food for all crops and nitrate of soda and sulphate of ammonia are standard nitrogenous materials. The former is a whitish crystalline

salt and is used to supply the immediate stimulant that young crops are in need of in the early stages of their growth. Sulphate of ammonia is also a whitish substance and is next to nitrate of soda in importance.

Phosphoric acid is closely connected with the building up of the stem and roots and hastens the maturity of all crops, and is procurable in a form known as Superphosphate.

Potash mainly influences the flavour of fruit and can be applied in the form known as Sulphate of Potash.

There are other artificial manures available in the market, but those mentioned are the ones usually used by the general gardener and it would serve no useful purpose to enlarge on the subject.

Chapter Twenty-one.

PROPAGATION.

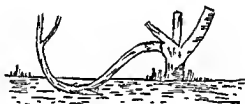
IN nature, plants normally reproduce themselves from seed, but it is a well-known fact that plants so grown cannot be depended upon to resemble their parents in every particular, especially as regards flowers and fruits, so we find it necessary to use some part of the plant itself to ensure the certain multiplication of a certain variety.

Some of the methods most commonly used are by cuttings, layers, gootie, budding and grafting.

The onset of the cold weather is generally the most suitable time for the insertion of cuttings. The branches selected should be well advanced in their development. They should be cut into lengths of about nine inches each consisting of about three or four joints. The bed for cuttings should be made of well-drained garden soil mixed with a quantity of sand, and to prevent excessive evaporation until the roots form, the site selected should be cool and shady. To diminish transpiration all leaves should be shortened to about a third of their length. All hard wooded plants take root best in pure sand, and soft wooded plants require light soil. Cuttings struck in a sloping position do best with most plants, while some do very well any way. Only a couple of buds should be left out of the soil, certainly not more than three in any case. It is also possible to strike many varieties in water. These cuttings should be of green wood taken during the full growing season, and the bottles used should be large and the water changed frequently. In doing so they should be replenished with tepid water, and be sheltered from wind and sun, but

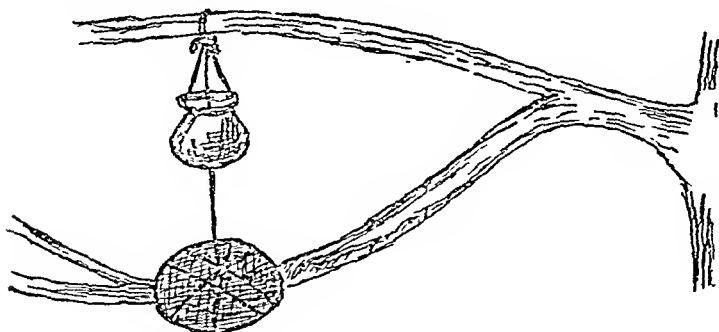
having all the light and air possible, and be removed from cold air at night into a room. Heliotropes, Verbenas, Habrothamnus, Lobelias, Begonias, Roses, Salvias, Balsams, and Dahlias may be easily propagated in this way.

Plants such as Allamandas, Bougainvilliers, Oleanders, and some others are difficult to propagate by cuttings, so recourse is had to layering. The branch is bent to the ground or to the surface of the pot which has been filled with soil and placed on a stand of the required height. A slanting cut three-quarters of the way through is made in the branch under a leaf bud, and the slit is kept open by means of a small pebble. This portion is pegged down into the soil firmly and kept in position by a large stone being placed on top. Water should be applied occasionally as in a growing plant, and when the roots are properly developed the layer can be separated. The figure shows the method of layering.

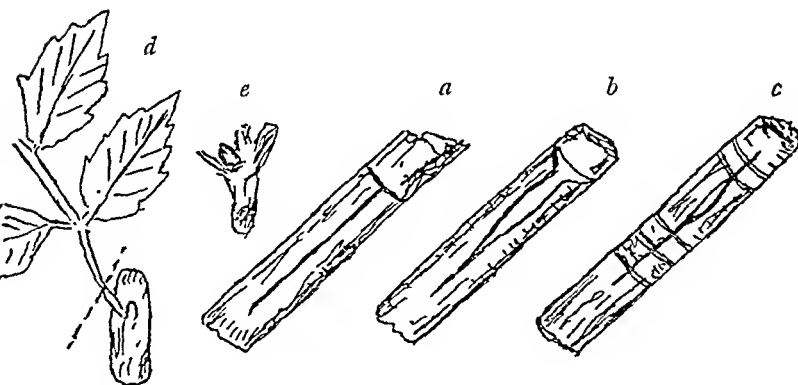


The gootie is an Indian variation of layering and is quite simple to perform. It is used with success for the propagation of many kinds of plants, such as Crotons, Dracaenas, Limes, etc. A complete ring of bark should be removed from just under a leaf or leaf scar and this portion should be carefully covered over with well kneaded clay bound over with a bandage to keep it in place. Very often, instead of the clay, moss is used with equally good results. The covering should be always kept moist and to facilitate this an earthenware pot full of water should be overhung, and by means of a string passing through the bottom of this water is constantly trickling through to the clay. The gootie can be cut away and planted when

roots are seen to protrude through the clay or moss. During the rains the results are quicker than at other times of the year.



The operation of budding is generally limited to the propagation of Roses and Oranges. It consists of removing a bud from one plant and causing it to grow on another. To ensure success the season chosen should be when the plants are in active growth.



Make a cut along the length of the stem, and one across it at the top, so that the two cuts will form a T. See fig. *a*. Now select a plump bud with its leaf stock attached, and cut off the leaf only. See fig. *d*. Remove the bud carefully by passing the knife under it, working from about half an inch above it to half an inch below

it The wood that comes off with the bud should be removed, carefully preserving the eye from injury The bud as in fig e will now be ready for insertion into the stock It should now be inserted in the T and bound up with raffia, figs b and c will illustrate this After the bud has shot out about an inch the binding around it should be loosened, if it has not already occurred through rotting off By constant pinching of the growing parts a bushy plant can be obtained In places where the situation is exposed to winds the growing branch should be staked to prevent its being broken off The stock plant should be headed in after the new plant attains a certain amount of vigor

Grafting is a method usually used in the propagation of mangoes by the system of inarching, however a variety of grafting sometimes performed is known as cleft grafting, i.e. the insertion of the prepared scion into a cleft made in the stock

The plants bearing the scion and the stock should both be in a growing condition and the season chosen should be about the middle of the rains, but this greatly depends on the growth of the trees or shrubs in question The scion should have plump buds and be of well ripened wood



Cut off the head of the stock and make a slit in it about four inches long according to the length of the prepared scion, the lower part of which should be shaped to fit the wedge This should be accurately done and the union tied with tape and covered over with grafting wax or clay, to exclude air To make grafting wax take pitch and resin four parts, beeswax two parts, and tallow one part These should be melted and thoroughly mixed, and when required for use applied lukewarm

Chapter Twenty-two.

GARDEN DESIGN.

COMMON SENSE is one of the chief attributes towards success in the art of garden making. This coupled with a love for flowers and a knowledge of their requirements will bring the beginner far greater success than any ability he may have for plan drawing. The only way to secure artistic and beautiful effects is to go to Nature direct for a model. A garden is a place of pleasure and recreation, and where the area is large enough, there can be no possible harm in erecting comfortable summer houses, seats and resting places from which to view its beauties, even though these are not to be found in ideal scenery of the natural type. Although there can be nothing more distressing to the gardener than the idea of making gardens to a stock plan, yet ignorance is largely discounted by the possession of one, though it is true enough that a plan conveys no real impression of the aspect the garden will assume. A handsome figure on paper has quite a different effect on the ground. A plan is merely a design, and with a design in front of him a gardener can at least determine whether or not he is making the most of the ground. A design shows the garden at a glance, in other words, the framework. Monotony must be guarded against. Variety is the soul of a garden and especially is this so of a small garden. The greater the variety the more sustained is the interest. Garden design has been divided into three classes :—(a) the formal or geometrical, (b) the gardenesque,

and (c) the naturalesque. The first is one of the oldest systems and was designed to conform to the house which was built chiefly in lines and set designs. The third, as its name implies, is the copying of Nature and this system is practised in the extreme by the Japanese. The second is really a compromise between the two and is at present most generally applied. There is great difficulty in defining this subject, hence common sense must be coupled with these principles, a great deal lies upon individual taste and circumstances.

Gardens around bungalows where Europeans live should be made to look as "homelike" as possible. Characteristic sweeping drives bordered with shrubs and flower borders, beds of flowers, bowers of roses, and verdant lawns should be the predominating ideas. The layout of the garden must be considered the framework for the residence and in designing such, it must evolve with due regard to the outlines, requirements and approaches of the building. The nature and position of the site must be considered, and these with the general view of the surrounding vegetation determine the best use the ground can be put to, either for the accommodation of a flower or rose garden when it is in the north and east, or game courts, lawns, shrubberies and trees in the south and west.

There are often places in a garden where planting is out of the question, also there may be mounds which would be better covered than removed, all such can be converted into Rockeries. In general for rockeries which are intended to be covered with plants, any stone material may be made use of, according to the taste, requirements and necessities of the gardener. As a rule, rockeries should never be raised on grass, but on gravel or a concrete foundation. Rockwork forms a very suitable skirting round a pond or a water tank, and makes an effective addition to a gravel path, such as a carriage drive, which

without such rockery would have nothing to relieve its barrenness. The usual idea of a rockery is often a bank on which stones are grouped in irregular fashion, with plants dotted here and there. This is a wrong impression. A rock garden should be in an open position away from tall growing trees. The mounds of soil, not the stones, must be placed in position first, after which the stones may be built up in any way that good taste suggests, spaces with more or less surface being left which will in this way form beds for different plants.

Other garden decorations are the pergola, arches, pillars and arbours. The natural and appropriate use for arches is to mark divisions in the garden, and the proper thing for a straight walk is a pergola. A pergola is a connected series of arches and has the uprights eight feet out of the ground and eight feet apart. A pergola has come to be looked upon as a necessary feature in a good garden; as a support for climbing plants it has many advantages. Still the building of a pergola when it can be avoided is inadvisable. A pergola in the wrong place is distressing; an ugly pergola is a sin against art; a well-placed pergola, of good design, suitable for climbing plants, may be a delightful feature while the plants are in bloom, but it will not be cheap and will need a great deal of attention. The best position is as a covering to a walk leading from one portion of the garden to another, but then it must be considered from several standpoints, for it sometimes happens that a pergola has been erected where it destroys the best view in the garden.

A very pleasing form of creeper cultivation is to set up a pent house of three or five short bamboos, and so cover with the smaller growing creepers as to conceal the woodwork. These little pyramidal groups, well trained and pruned and covered with flowers, are beautiful objects on the lawn, or at intervals between flat beds, on the side of a drive or large walk.

LAWNS

This forms an important part of any garden. In large parks lawns are not expected, only the natural herbage is regularized and kept in good order. The extent and position of a lawn depends upon local circumstances. Ordinarily it is near the house. The largest part of a lawn should be on the sunny side, for it is pleasant to the eye to look upon green grass, but at least a small and cosy part of it should be in the North and West side, as being more shady and cool. A few specimen umbrageous trees may be allowed for purpose of shade and sitting under, but should be limited. The flower garden should lead on to the lawn, which may either be distinct in itself with its own outline and bordering, or merge into that of the park or naturalesque portions of the grounds.

A well-kept lawn is a source of never-ending pleasure to its owner, and is to a garden what a background is to a picture. Its green appearance is soothing to the eye and it gives a sense of coolness to the surroundings. It enhances the beauty of any garden and gives the impression of space and imparts breadth and dignity.

In India good lawns fulfil many requirements—for nine months in the year they are in almost daily use for a variety of games, such as tennis, badminton and croquet, and are also the meeting places for social and other gatherings. Lawns required for games are in a way different to those required for ornamental purposes, in that they require special preparation and maintenance.

Before a lawn is made two important things must be sought, a well-drained soil and proper materials for forming the surface. Soils which contract and expand in a marked degree under climatic influences, will never produce a good turf. What is required is a fibrous, homogeneous soil, which protects the surface rooted grasses from

drought and heat. Grass in growing also emits roots just above the surface of the soil, and by applying a periodical top dressing of sand for them to work among, a mould of sand a few inches in thickness would soon be formed, which would check the gross character of the grass and make it spread out and grow more thickly, producing that fine velvety appearance and soft trend so much desired in lawns. The surface water will also pass freely down which will keep the grass from becoming muddy and plastic. The best land for a lawn is that which has been under cultivation for many years. If the drainage is bad, the soil becomes sour and enfeebles the grass and encourages the growth of weeds. A gentle sloping of the land will be sufficient to carry off the surplus water. The close proximity of tall trees to a lawn is most injurious to grass; apart from the dense shade cast by them, their roots take advantage of the loose, rich soil and the grass suffers and is frequently killed.

In the making of a lawn the operation of trenching at least three feet deep is of primary importance and is the chief secret of success. At the time of trenching a layer of at least six inches of manure should be placed at the bottom of the trenches. Trenching should begin in March or early April, and the soil left in the rough state throughout the hot weather, to the exposure of the hot winds, sun and air, which have a wonderfully beneficent effect on the soil. After several heavy falls of rain the ground should be roughly levelled and all depressions filled in. After further soakings the plough should be used, at the same time top-dressing the soil with some manure. Then the final levelling must be done and the excess soil collected into heaps which will come in useful for covering the grass.

Cutting up the stems of "dub" grass into lengths of about two inches and sowing broadcast over the ground, and then covering with a thin layer of soil, is the method

in general practice. In the hills grass seed is used, which may be obtained from any European nurseryman, and the best periods for sowing are in the months of March and April, or after the first burst of the rains. About 50 pounds of grass seed is required to sow one acre.

Dull weather is the best time for sowing and within ten days the grass should show signs of growth. Land trenched in May or June, and sown with grass not later than the first week of August, should produce a lawn in a fit condition for games in the month of November.

The grass should be cut to encourage lateral shoots when about three or four inches high. This cutting should be done with a scythe or "jhabau," which is a heavy knife, something like an uncurved sickle. Subsequent cuttings will be made by a mowing machine. A close cutting machine is not essential until the lawn is needed for playing purposes, and a good all-round machine is the "New Excelsior" obtainable from any of the leading ironmongers, an 18-inch cutting knife is the most useful size for general purposes. For close cutting, a "Ransome" or a "Green" machine is undoubtedly the best. They are obtainable from the same firms, and though expensive, with care will last for years with an occasional change of cutting knives. Cut grass should not be allowed to fall on the lawn as it ultimately forms a mass of dead material which not only looks bad but is apt to encourage white-ants.

For the first three months after the grass is sown a light iron roller will be sufficient, and not till November or December will a heavy roller be necessary.

When a lawn is watered it should be done thoroughly, and should never be allowed to become dry. The number of waterings and the amount of water necessary will depend on the nature of the soil. More water will of course be

required during the hot months than during the cold season. Water obtained from a well is distributed over a lawn by means of zinc piping, which, besides being cheap, will last for years if taken care of and kept in repair.

Generally speaking an acre of lawn requires five waterings a month for four months of the hot weather and three waterings a month for five months of the cool season. Reckoning 25,000 gallons of water per watering, an acre of lawn will require 875,000 gallons for a year of nine months.

An annual top dressing with manure is essential to keep a lawn in good condition. A practice which has much to recommend it is to shave the whole of the grass surface at the end of the rains, giving a top dressing of manure when new shoots appear. Lawn sand, made by mixing thoroughly two pounds of Sulphate of Ammonia with 15 pounds of sand, is an excellent top dressing employed to assist the growth of grass and also to keep down weeds. Lime is of great benefit to lawns. Not only is a good dressing of lime highly beneficial on account of its killing moss and encouraging the spread of grass, but it destroys and drives away worms. To get the lime on regularly it should be slaked and mixed with moist earth, which by giving weight prevents it from flying about when being sown.

Moss is a great eyesore and many lawns are subject to it. Some people have an idea that moss on lawns is caused solely through want of drainage, but we frequently find that the driest of soils are most subject to it, for if grass gets killed or weakened by the hot weather, moss and weeds quickly take its place. The best cure for it is hot lime, which with a little soot added greatly improves the appearance of the grass.

Worm casts on lawns are particularly objectionable, yet the presence of worms might be regarded as more useful than otherwise, for they are the means by which Nature manures the grass and drains the surface, moreover, their presence is a sign of good soil, as their food consists of decaying vegetable matter, which after being digested by them are ejected in the form well known as worm castings. Mix about a dessert-spoonful of phenyle in a pailful of water so as to make the water slightly milky, pour this mixture over five or six square yards, the worms will appear above the surface and crawl about when they may be collected. The solution will not injure the grass. A dressing of sharp gritty sand will send them to the lower strata.

Chapter Twenty-three.

FLOWER BEDS.

TO get the full benefit of their floral display all beds must be assigned to a northern and eastern position. The architecture of the building must be the governing factor of the design. The plates incorporated in this chapter illustrate key designs that can be developed to any extent with one, two or three centres, according to requirements and space. Excessively large beds should be avoided as well as complicated designs. When planning out a design, the turf space between beds should never be less than twice the width of the bed it frames, and in some cases a greater width still is found desirable.

The shape of the bed in which plants are grown have an appreciable influence upon their appearance. To display a certain flower of average height, probably a round or oval bed all to itself cannot be beaten. Small beds in large gardens must be few, and only placed in curves of grass or gravel where there is not much room. A number of small beds give a spotty and unpleasing effect to the scene.

Besides the round or oval beds there are other methods whereby different flowers can be assorted pleasantly, as well as other shapes for beds. Different shapes for small beds, one beneath each of the standard roses that are often ranged along lawn edges, will do much to relieve the monotony that exists before the different colours of the roses appear. The uncommon is not always beautiful,

vet of the two flower beds, one perfect in design, the other less artistic but quite original, the latter will be the better when properly filled. It is quite possible, however, to combine loveliness and the unfamiliar, especially when flower and foliage plants are the artist's pigment. The end of a lawn is often the site for a wide border bed of straightest formation, the result is much better when the border is cut in two and a grass walk left between them, an arch being put up to span this.

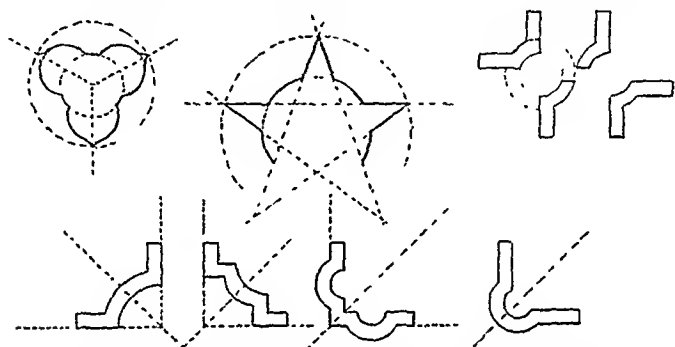
Simplest beds are often the best, and when properly filled look delightful. The gracefulness of half moon-shaped beds make them especially valuable for lawn ornament and they can be well placed springing out of the corners of grass plots, large or small, two beds with the points opposite one another, only a narrow space being left between for traversing, can occupy the centre of a lawn or gravel square, with a standard rose or other ornament in the middle. The shape is easy to cut, simple to fill effectively, and offers no obstacle to the workings of the lawn mower.

If some evergreen plants are put into the beds early the work of arranging the flowering bedding plants afterwards will be greatly simplified, and the effect much improved. All beds in a garden should not be treated alike, no matter what method is adopted. Dividing lines among gay flowers show them off to perfection. Simplicity of design should be studied, and this is gained by not mixing too many flowers. Most of the charming evergreen dwarf plants have a blossom, but it is for their foliage that they are valued.

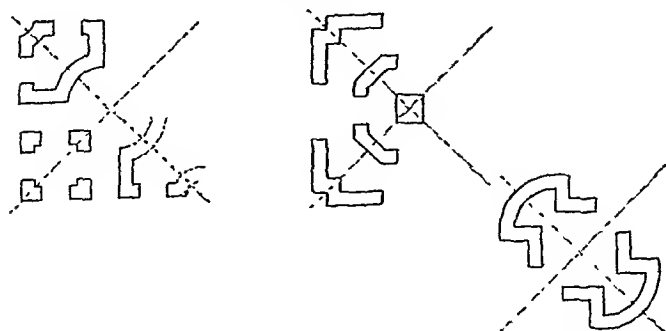
A round bed well edged in scallops is pretty, the scallops can be filled with dwarf evergreens or in a colour-scheme. Beds with curved outlines are, of course, more difficult to cut out and peg satisfactorily than are those with straight lines or points, but any one can perform the work if he takes pains enough. It is best to use a number

of small white pegs, and when accurate measurements have been made these should be placed two or three inches apart until the design is known to be quite accurate. When the final measurement is made the cutting out of the turf or the forking up of gravel can be done. Before the design is cut it is a good plan to outline it with lime, as a very good impression is obtained of the future "look" of the layout.

These designs may any of them be set in a round or square of gravel or turf, or occupy positions in lawn corners.



Square beds can easily be altered by cutting off the corners and so making them oblique, or by adding points to the



centre of the four sides. Another change is, if instead of the points, half circles be added to the four sides; or instead

of the points being made outside the outline, they had been turned inwards

The corners of lawns are wasted unless beds are made in them, or pillar roses, clumps of grass, specimen trees, shrubs, giant plants, rockeries, vases or mounds fill them. Now there are some beds that look awkward when set in corners, others that are just suited to them, a shield, oblong or oval, never looks well, but a diamond with one point to the corner fulfils every need, a round is tolerable, and so is a heart shape.

Round and square flower beds are common in gardens, so the demand is for the uncommon, or at least beautiful ways to plant them, and there are many which can be thought off. Beds of elaborate star or other shapes are easier to fill effectively than are plain rounds, squares, etc., so extra care should be devoted to the latter to show off the plants to the best advantage.

Border designs are useful in both large and small gardens and make a most effective feature. A beautiful effect can be obtained by surrounding a large lawn with a border bed, only breaking it at intervals to allow of entrances and exits. A very wide walk can be turned into a floral display if a border is run down its centre.

The designing and filling up of an herbaceous border is a most fascinating bit of work and when well and thoughtfully done is extremely beautiful.

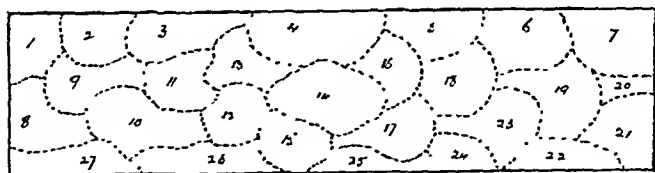
The straight edged border is most commonly to be seen and should be replaced by the border with shaped edges. These look very pretty and show off flowers much better; a background massed with tall subjects can be given a lighter effect if the scallops in the front of the border are filled with dwarf plants. Colour harmonies are more easily arranged. A simple wavy border is more picturesque than a straight one and the wider it is the more original is its appearance.

Various outlines can be given to the border, but they must be made so that the mower can be easily worked along the edges. An elaborate edge is shown below and is sometimes a pretty feature, and once the trouble of pegging it out is over, the result will long continue to please.



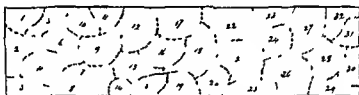
A succession of points gives an elegant effect and offers many nooks in which miniature plants can be charmingly grouped. Edgings for elaborately cut borders must be as unobtrusive as possible, as they interfere with the sharpness of the outline. In the large majority of borders some groups of taller plants should appear near the edge occasionally, as the eye tires of monotonous levels.

The following are two suggestions, which can be enlarged upon, towards colour harmony in the herbaceous border :—



- | | |
|-----------------|-----------------|
| 1. Pale pink. | 8. Pale blue. |
| 2. Blue. | 9. Pale yellow. |
| 3. Orange. | 10. Crimson. |
| 4. Pale yellow. | 11. Rose. |
| 5. Cream. | 12. Lemon. |
| 6. Dark red. | 13. White. |
| 7. Violet. | 14. Dark blue. |

- | | |
|----------------|---------------|
| 15 Yellow | 21 Crimson |
| 16 Orange | 22 Pale cream |
| 17 Cream | 23 Orange |
| 18 Rose | 24 Dark pink |
| 19 Pale blue | 25 Lavender |
| 20 Pale yellow | 26 Apricot |
| 27 Pale pink | |



- | | |
|------------------------------|-------------------------------|
| 1 Canna yellow | 17 Poppy pink and white |
| 2 <i>Acroclium</i> rose | 18 <i>Dianthus</i> salmon |
| 3 <i>Verbena</i> blue | 19 Mignonette |
| 4 <i>Gypsophila</i> white | 20 <i>Brachycome</i> white |
| 5 Cornflower blue | 21 <i>Antirrhinum</i> yellow |
| 6 <i>Antirrhinum</i> nelrose | 22 Larkspur blue |
| 7 <i>Nasturtium</i> salmon | 23 Sweet pea cream |
| 8 Phlox yellow | 24 <i>Antirrhinum</i> scarlet |
| 9 <i>Linaria</i> yellow | 25 Phlox scarlet |
| 10 Sweet pea white | 26 <i>Linaria</i> pink |
| 11 <i>Salpiglossis</i> | 27 <i>Escholtzia</i> yellow |
| 12 Larkspur pink | 28 <i>Leptosyne</i> yellow |
| 13 <i>Dianthus</i> white | 29 <i>Gamolepis</i> |
| 14 Pansy mixed | 30 Aster blue |
| 15 Stock blue | 31 <i>Ageratum</i> pale blue |
| 16 <i>Salvia</i> scarlet | 32 Canna dark red |

After pegging out the design comes the very important item of the preparation of the beds. On this preparation

depends very largely the ultimate growth and floral display of your plants. Each bed must be dug out to at least a foot-and-a-half in depth, and if this digging be done in the hot weather so much the better. When filling in, a large quantity of leaf mould and thoroughly decomposed manure must be incorporated with the soil, thoroughly watering and working it before planting.

COLOUR.

There are various ways of arranging your beds, the most common being either by colour contrast or colour harmony. Where strong colouring is necessary, such as the entrance border or drive, colour contrasts should be aimed at, such as white and red, not white and yellow which is an example of colour harmony. The effect of colour in a flower garden is a most important item. It is an easier matter to propagate the stock of plants necessary to fill up a flower garden than to arrange them to produce a pleasing and harmonious effect. Of course there are certain difficulties which arise; for instance, out of the varieties of heights and habits of the plants, and in the unsuitableness of garden design, especially in those where the beds are large and too close together, or *vice versâ*. Under such circumstances it is most difficult to apply the principles of either harmony or contrast, and at the same time give essential prominence to symmetry. But, after all, there are few places not even in the smallest gardens, which do not afford an opportunity to some extent for a definite system of arrangement. A single bed in an isolated position may be made to display the effects of either harmony or contrast, or both, in flower gardening.

The experiment of admitting a ray of sunlight through an aperture into a dark room, and after it enters making

it pass through a triangular glass prism on to a white wall on the opposite side of the room, analyses the light and shows us of what colours it is composed. Immediately on passing through the glass prism it is dispersed and forms on the wall an oblong figure of seven different colours. If these colours are printed on a circular card in the order and proportion shown on the wall, then the circle which is divided into 360 degrees would be divided as follows — Violet 80, indigo 40, blue 60, green 60, yellow 48, orange 27 and red 45. Red, blue and yellow have been termed the three primary colours because the others can be produced by mixing these in different proportions. To ascertain the correct contrasting colour to any particular colour, find its exact opposite in the circle. Take violet for instance, if a line is drawn from the centre of the space occupied by violet to the opposite side of the circle its terminal end will be in green, but near to yellow, which determines that the contrasting colour to violet is green with a little yellow mixed, or bluish green. The following is a table of colours and their contrasts —

Black	White
White	Black
Red	Bluish green
Orange	Blue
Yellow	Indigo
Green	Reddish violet
Blue	Orange
Indigo	Orange yellow
Violet	Bluish green

In the same way harmonising colours can be readily determined. That which harmonises with any particular

colour is always next the original colour and between it and the contrasting colour in the order of the diagram. It will be seen that red is the harmonising colour to orange, blue to violet, yellow to white, and so on. Red or scarlet, dark or pale pink, and white form a pleasing harmony from red to white. Again take a purple flowering plant with a shade of red in it and place it near a crimson, or let a golden leaved plant be associated with another species having silvery foliage, and a most delicate and pleasing harmony is obtained. Harmony and contrast can also be illustrated with charming effect in one design or bed. What can be more lovely than a centre of yellow with a corresponding zone of white, finished off with a fringe of blue or purple. The two centre colours harmonise, while the blue contrasts. If two contrasting colours, yellow and blue, are mixed in a bed and edged with red, which harmonises with the orange, the effect is very fine. In filling a bed with three colours in distinct zones, the two harmonising should always be in the centre, and the contrasting colour as a margin. Where plants are of various heights a portion of the soil from that part of the bed where the taller things are to be planted should be thrown on to the space allotted for the dwarfers. As a general rule the taller plants should be put in the larger beds and *vice versâ*; and all beds exceeding 12 or 14 feet in diameter should be planted with two or more colours, in order to relieve the heavy mass of colour; the strongest colours should be at the margin. In planting a group of beds on the complementary principle, the centre or key bed should never be the most brilliant; the stronger colours should be at the extremity of the design. Cream, lemon and gold have a wonderful power of softening violent contrasts. Scarlet is difficult to place because so many flowers are pink, carmine, mauve or purple; but with plenty of

cream, yellow, orange or flesh it is always pleasing, and the shades of blue and violet are well shown off by it. If violet and purple have to be placed near each other, place a vivid mass of orange or gold between them. Golden scarlet and rose pink can be rendered tolerable together if a quantity of gold blossom separates them. The finest setting for rose pink flowers in a bed, border or shrubbery, is a close background of gold variegated foliage with side masses of pure white flowers, the yellow variegation supplies the want of yellow in rose and crimson. Salmon pink is more pleasing when alone. A group of Delphiniums on a lawn is charming, but if there is a bright gravel path near, or a bed of yellow or apricot flowers, the effect is infinitely improved. Carmine against a grey wall is unpleasing unless there is also some cream or lemon yellow flowers that present the same effect. Rose pink and gold can be safely mingled, but they must be far away from scarlet flowers, and the gold should have no tint of orange. Magenta is the deepest shade of brilliant rose pink, so is best associated with it, but cream is the other colour that suits it, as also pale mauve and lavender. Vivid rose and carmine should have copper or crimson coloured foliage plants as a background. Crimson flowering climbers look best on a cream white house. In order to intensify the effect of scarlet it should be surrounded with white flowers. White and green foliage shrubs and trees are admirable as a background to red. Scarlet and yellow are often too gaudy in combination, but they tone well if orange is placed between them. Vermilion and scarlet should never be mixed, scarlet and pale blue are very pretty together. Violet is extra well shown up by silver or variegated foliage, and it can never be harmoniously used with blue. Purple and pale blue or lemon yellow always please and mauve is very pretty with pale pink, purple and snow white are a fine contrast.

The following are colour schemes for one bed either mixed or in zones :—

Pink, yellow and salmon shades.

White and pale blue shades.

Pale blue and cream shades.

Salmon pink and pale blue shades.

Rose pink and pale blue shades.

Cream and maroon shades.

Salmon pink and crimson shades.

Red, white and blue.

The following are a few suggestions for filling large beds in a colour design :—

Centre yellow, zone white, edged blue.

Centre yellow and blue mixed, edged red.

Centre red and blue mixed, edged yellow.

Centre purple, edged crimson.

Centre orange, edged red.

For instance, circular or diamond shaped beds of white phlox or candytuft with centres or edges of red phlox, or mixed with larkspurs; or lobelias edged with gamolepis; or beds of cornflower or gypsophila with poppies mixed would appear quite pretty. In large gardens along carriage drives a strip of grass having in the centre beds of flowers, alternating with small round beds each filled with a plant of the *Livistonia* palm is one of the most pleasing forms of decoration possible.

The following arrangement obtains a good colour effect —

White and cream

Yellow

Orange

*Scarlet

Orange

Yellow

Cream and white

Pale blue and mauve

Blue

*Purple

Mauve and pale blue

White and cream

Pale pink

Pink and rose

*Crimson

Rose and pink

Pale pink

Cream and white

The asterisks indicate where the deepest tones should be used *Palest shades to be used in front of the border*

Chapter Twenty-four.

POT PLANTS.

THE cultivation of plants in pots plays a very important rôle in most gardens, especially where the compound is limited. Certain plants grow best in pots, while others are grown in them simply for the sake of ornament.

Pots are made in many shapes, but the ones most commonly used are the upright and the flat; the latter being known as a pan. The pan is used for the sowing of seeds and also for the growing of plants in groups so as to show masses of flower.

All new pots should be well soaked before being used and all previously used pots should be thoroughly washed and scrubbed.

Healthy, well-grown plants look well in pots, and when they receive suitable treatment add greatly to the charms of the verandah or greenhouse. Besides annuals and ordinary greenhouse plants, almost any plant can be grown in a pot for decorative purposes, up to a certain age. Of course there are exceptions, but these are few compared with what can be so grown.

The mixing of different sorts of soils and manures for potting plants in general is an evil to be avoided, and a plant that thrives in loam will thrive better in it ultimately if there are no animal or organic manures mixed with the

turfy loam The excrements of animals and decaying vegetation are undoubtedly beneficial to plants, but not mixed with the soil in a narrow deep vessel like a flower pot Such substances are best applied as a top dressing Take a Croton for instance, it thrives splendidly in light turf loam and requires nothing else till its pot becomes filled with roots Then a top dressing of rich manure is of immense benefit to the plant which, if mixed with the soil at the time of potting, is not only injurious but unnecessary As a rule we neglect Nature's method of potting and nourishing her children Generally we put manure of too gross a nature into the soil, Nature lays it on top

Charcoal is a great help in potting plants It has a wondrous charm for roots and is of the foremost importance in the soil of nearly all pot grown plants A good all round compost is made up of four parts of good garden soil, two parts of leaf mould, one part of decomposed manure and half a part of sand This should be thoroughly mixed together and with the aid of a sprinkling of water made thoroughly moist

In filling pots arrangements should be made for drainage and at least a quarter of the depth of each pot should be filled with broken crocks On this place a layer of cocoanut fibre and then fill with soil as much as is necessary to allow of the top of the ball of soil round the roots of the plant to be potted when placed on it to be about half an inch below the rim of the pot Then while holding the plant in position gradually fill in the sides with the compost and press down firmly This operation of pressing the earth around firmly is very essential and must be properly attended to

When potting on plants do not remove them to a very much larger pot, a size bigger is all that is required Generally speaking when the roots of a plant begin to protrude out of the hole in the bottom of the pot, then it needs shifting into a larger pot It must be remembered

that a certain quantity of soil is consumed in the form of nourishment by the plant, while other portions are washed away in the drainage; therefore it is necessary to re-pot plants once, twice, or even thrice a year, even should they not have outgrown the size of the pot. Sometimes, however, surface dressing is resorted to; that is, a portion of the surface soil is removed and replaced with fresh rich compost. Several varieties of plants are much improved by being watered with liquid manure once or twice a week, taking care that it does not touch the leaves; also that the manure used is old, and the water when taken off the manure is clear. In some instances, such as in that of Geranium plants, they improve by being to a certain degree pot bound, and then being supplied with liquid manure, and are forced into flower.

Watering is a very important operation in the culture of pot plants. Heavy watering is injurious and no pot should be watered unless the soil really requires it. When a pot really requires watering a hollow sound will be emitted if it is tapped against the side with the knuckles or a stick. When a pot has been left unwatered for a considerable time it is best to stand it up to its rim in a tub of water until the soil becomes thoroughly saturated. Every advantage should be taken of rain and as far as possible all pot plants should be given the benefit of a downpour. Watering should be done in the morning and evening, and where the nights are cold and frosty it is better to water in the mornings only. Care should always be taken never to water plants while the soil and leaves are yet warm from the effects of the sun. Should any plant be drooping for want of moisture, it is best to remove it into the shade for an hour or so, till it cools, and then to water it, and after a time to return it to its original place.

In towns where dust and dirt accumulates rapidly on the leaves, not only should the syringe be used freely

after the sun has gone down, and in the early mornings, but the leaves should occasionally be wiped gently with a soft sponge or rag dipped in soap suds and water.

When plants are used for room decoration it is always best to remove them outside at night time and bring them back again in the morning. It is also a good plan to replace the ones in use, say every week or so, by others, this gives variety which is always acceptable to the eye.

Where practicable it is always a good plan to have your pot plants neatly labelled, at least the more rare varieties. Zinc labels are the most serviceable written on with a solution of copper sulphate.

Chapter Twenty-five.

PLANT DISEASES.

BY far the greater number of plant diseases are caused by the action of parasites. Probably no plant is free from them, and the more widely cultivated crops have to contend with a formidable number of parasitic foes. All parts of a plant are liable to be attacked; the surface may be the only point of invasion or the parasite may burrow deeply into the tissues. On the habit and structure of the plant, on the character of the parasite and on the point of attack, will depend the nature of the injury. In some cases it may be little more than the loss of some food material, but it is usually the complications that result that do the harm. The presence of internal parasites often excites a morbid growth of the plant tissues, causing galls, knots, or other deformities, or they may cause an excessive formation of gums and resins.

It should not be forgotten that cultural methods aid the plant in resisting disease. Proper rotation of crops, green manuring, good cultivation or the applications of certain fertilizers, all have the most beneficial effect in the suppression of insect pests. One of the most important safeguards against insect pests or fungus diseases, in many cases, is to maintain a vigorous condition of the plants cultivated.

Generally speaking insects which attack plants are of two kinds: (a) Biting insects, such as caterpillars, grasshoppers and beetles, which eat the leaves and buds of the

plants, and (b) Sucking insects, such as green fly, mealy bugs and scales, which suck out the sap from the leaves and tender portions. As a result remedies in the way of poisons employed are of two kinds. (a) Stomach poisons used against biting insects. They are devised to kill the insect and also make the plant unpleasant to feed on, and (b) Contact poisons used against the sucking type and applied to the insects themselves. They generally contain some sticky or irritant materials, such as soap, rosin or phenyle, which by forming a coating around the insects prevents them from breathing.

Great disappointment and often loss are occasioned in a garden by the ravages of insects. Caterpillars are the most familiar of these pests and should be picked off and destroyed as soon as they are observed. Some kinds only feed at night and search for them should be made in the early morning or late evening. Some kinds of beetles are also destructive, their grubs often infest manure pits, so all manure should, as far as possible, be closely examined before being used. These grubs ruin many plants by eating away the roots.

Everything considered, the sucking insects, consisting of several species of *Aphis*, mealy bugs, thrips, scale insects and the red spiders, are the most serious insect pests that we have to contend with generally. The *Aphides* are small greenish or black soft-bellied insects, they are gregarious and increase enormously and rapidly. Contact sprays, such as kerosene emulsion or tobacco water, will destroy them.

Mealy bugs derive their name from a whitish floury substance with which their bodies are covered and unless applied with sufficient force, sprays are ineffective because of this covering. Generally where there are mealy bugs there are various species of ants that carry them from plant to plant. Prune away the worst infested parts and spray kerosene emulsion on the remainder. All ant nests

near by should be destroyed with boiling water. Spraying with a strong solution of salt water has been found to be effective in removing mealy bug.

Termites are a very serious pest, but it must be remembered they generally attack only in dry ground, so those plants that are liable to attack should have the surrounding ground always kept moist. A little crude arsenic, about a tablespoonful to a gallon of water, applied to the roots will drive them away. Neem oilcake is another deterrent, and it is a good plan when putting in new plants to always mix half a pound of neem oilcake with the soil around each plant. Arsenic is only necessary when this pest is found in great numbers and are very persistent.

The ordinary ant is sometimes a nuisance and may be destroyed by leaving half picked bones about, and when covered with them, dropped into boiling water. Sulphur powder is harmless and will drive them away from pots when sprinkled over the soil. Camphor water is also useful. Chalk, when applied round the stems, prevents them from ascending.

Rats occasionally prove a great nuisance to lawns and flower beds; the best and most economical remedy is to flood them out. Cyanogas has been used successfully against them, as well as against porcupines and even snakes. It is procurable from any good chemist.

Soot water is most efficacious in eradicating earthworms. A weak solution of phenyle poured over the surface of the soil will bring them all to the top.

Slugs are not infrequently very destructive, difficult to get rid of, and not uncommonly are so numerous that they cannot be destroyed by picking. Bran is a favourite food of theirs when they can get it; place some in any spot

they frequent, and after dark they will be found on it, when they can be picked up and destroyed. The application of lime water is effective and is prepared by mixing one pound of unslaked lime to two gallons of water.

Kerosene emulsion is a good all-round spray for sucking insects and in order to be effective the spraying should be thorough and in a liberal quantity. Take two gallons of kerosene oil, one gallon of water and one pound of soft soap, dissolve the soap in boiling water and, while still hot, add the kerosene. Churn the liquid steadily with a syringe until it is emulsified. One part of this mixed with thirty parts of water makes an effective spray.

Rosin enters into the composition of several valuable spraying fluids for different forms of scale insects. It acts by depositing a covering over the insect, thus killing the latter by preventing its breathing. Four pounds of rosin, two pints of fresh oil, two pounds of caustic soda should be boiled together in ten gallons of water till the rosin is dissolved and then made up to 15 gallons. For use the solution should be diluted to ten times its quantity of water.

Tobacco juice is used with beneficial results against *aphides*, plant lice, etc. One pound of tobacco leaf should be boiled in four gallons of water and after straining should be diluted before being used. To render it more effective about half an ounce of soap should be added for each gallon. It is a good remedy for mildew.

Chapter Twenty-six.

THE CARE OF TREES.

IT has been said that if all the external factors which influence the growth of a tree are favourable there is no theoretical reason why it should not live in a healthy condition and increase in size indefinitely. But even since this is not the case owing to various unfavourable agencies there is not the least doubt that the term of years of many trees is shortened by neglect due to ignorance.

There are few gardens or parks of any considerable extent which do not contain trees whose size or rarity give them a peculiar value and it is not therefore surprising that there is a widespread desire to know how the decreasing vigour of such trees may be revived. The three most powerful agencies that bring about the destruction or decline of trees are wind, poor food supply and fungoid parasites. Trees that suffer most during storms are those whose main trunk forks low down, separating there into two or more great limbs and dividing the head of the tree into several distinct sections. The prevention of the forking of trees is a matter that should be attended to in the early stages of their growth. It is most important in the young state of large growing trees to keep them to a single leader as long as possible, thus laying the foundation of a tall, straight trunk capable of supporting the whole head of branches. Long spells of excessive drought undoubtedly hasten the end of many trees. When an artificial supply of water is available the soil should be thoroughly moistened all through, but it is remarkable

how much less effective artificial watering is than the natural rainfall. But it is probably certain that nothing hastens the end of trees so much as parasitic fungi, it is often their attacks that fatally reduce the wind resisting power of trees. Whenever a wound appears immediate steps should be taken to heal it. The most common cause of decay is neglect of cut surfaces left by branches being broken off by the wind or to stumps left after pruning.

When a branch has to be removed, or when the stump of a branch is left through breakage by wind, it must be cut right back to the circumference of the larger branch to which it was attached. If any wound is not covered decay sooner or later is set up, damp enters and a cavity begins to form. The prevention of disease by means of amputation and filling up of cavities has been appropriately named "tree surgery," the aim of which is to repair the damage resulting from neglected injuries and rotted areas. In considering this subject it is important to become familiar in a general way with the parts of a tree which are directly involved and how they are affected by the surgical methods employed.

A tree is composed of three main parts: the root, the stem and the leaf. The roots do not serve for anchorage but are the main passages for the entrance of water into a tree.

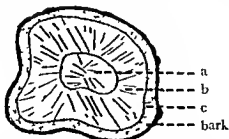


Fig. 1

In Fig. 1, *b* is the portion of the wood which lies immediately beneath the bark and cambium and is known as the sapwood, it is mainly through this that the water

passes from the roots to the leaves. The sapwood is of a lighter colour in many trees than the heartwood, Fig. 1, *a*, in the central portion of the trunk and limbs, and varies in thickness from a quarter of an inch to two inches and more, according to the size of the tree. The heartwood is practically dead tissue and gives stability to the tree. It is not active in conducting sap and thus it may often be partially or completely removed without causing serious injury to the tree beyond impairing its strength. Not so with the sapwood, for if any great amount of this, as measured around the trunk, be removed, the tree may be seriously injured or killed. Since the sap moves upwards through the minute tubes that run lengthwise in the sapwood, it is possible to remove a long and narrow strip of sapwood extending parallel with these tubes with less injury to the tree than would result from cutting out a shorter and smaller, but broader, area to an equal depth; this is due to the fact that a broader cut severs and renders useless a greater number of these sap conducting tubes.

From the standpoint of tree surgery the most important portion of a tree is a very thin, usually watery, layer of young tissue located between the bark and wood of all healthy parts of a tree. This is the cambium, Fig. 1, *c*. This cambium is constantly giving rise to new cells and it is this that covers all wounds in the bark of trees. If a portion of the cambium is killed, no more new wood or bark can again be formed under or over this area, but the living cambium surrounding the dead area will give rise each year to a new layer of wood and bark and will gradually push out over the dead area and eventually cover it. To effect this dead and decaying branches should be carefully removed in a manner that will prevent injury to the surrounding bark and cambium and all broken stubs should be neatly cut back. Any decayed or diseased matter in trees should be carefully cut out and the cavities filled in with cement.

For the work of removing branches the most essential implements are a good sized saw, a chisel, a hammer and a strong knife. A large limb should never be removed by sawing through from the upper side, as this usually strips the bark and wood below the scar. The proper way is to

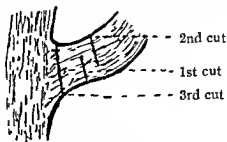


Fig 2

make the first saw cut on the under side, from six inches to a foot beyond the point where the final cut is to be made. It should reach from one-fourth to one-half through the branch. A second cut is made on the upper side of the limb, an inch or two beyond the first cut, and is continued until the limb falls. After the limb has fallen a third cut is made close to the trunk and in line with its woody surface. A coating of tar should then be immediately applied.

With cavities all decayed and diseased matter should be carefully removed, and thoroughly too, and the bottom and all other parts should be so shaped that if water be thrown into the cavity it would promptly run out again. After the diseased matter has been completely removed a coating of creosote should be applied and on top of this a heavy coating of tar. The cavity should then be filled in with cement, which is firmly rammed in and smoothed over.

Chapter Twenty-seven.

HEDGES.

HEDGES serve many useful purposes and should be made use of very much more than they are at present. They can prove ornamental as well, if use is made of the flowering varieties. They are largely used to divide off one portion of the garden from another and also to screen off unsightly parts. The stronger growing varieties create a means of excluding wandering cattle and other objectionable animals from entering the garden. The more fibrous rooted varieties, if planted horizontally on a steep slope in rows about 100 feet, prevent soil erosion.

The success of a hedge greatly depends on the proper preparation of the soil. Hedges are usually required to stand for a long time and no pains should be spared to ensure a strong free growth. The site must be trenched to a depth of about three feet and well decomposed manure incorporated with the soil when filling in. To allow for settling, the trenches must be well watered before putting in the hedge.

Most of the varieties of hedge plants are propagated by seed and these should be sown direct into the trench.

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All other methods of propagation should be carried out in nursery beds and transplanted into the trench when roots have formed

On wet ground it is advisable to plant the hedge on a ridge. Old hedges often become bare at the base, if such are cut down to about three feet from the ground, the lower parts of the stems will break out into growth and will in time fill up again

Bambusa —These are of various sorts and are very useful as well as ornamental. They are suited for growing on moist positions and form effectual wind breaks. Propagated from seeds and cuttings

Carissa carandas —The Karunda. A very thorny hedge that succeeds in dry positions. Very ornamental when the pink and white fruit appear in masses all over the plants. Propagated from seeds

Citrus vulgaris —The Khatta Lime. Forms a protective hedge of a very neat appearance and will grow in a saline soil. Propagated from seed

Dadonea viscosa —Forms a dwarf ornamental hedge and does not require much water. Useful for growing on saline soils. Propagated from seed

Duranta plumieri —An ornamental hedge that is very pretty when in flower. Can be kept dwarf or allowed to grow tall. Suitable for moist positions. Propagated from seed or cuttings

Hibiscus of sorts.—These make very ornamental hedges and are propagated from cuttings.

Inga dulcis.—The Madras thorn. A hedge very largely used, for besides being ornamental forms an effective protection, if properly trimmed. Will grow in a dry position and is very quick growing. Propagated from seed.

Justicia gendarussa.—Useful for dwarf edging to a border; usually kept trimmed to a height of about 2 to 2½ feet. Propagated from cuttings.

Lawsonia alba.—The Mehndi. This does not require much water; flowers very sweet scented. Propagated from seeds and cuttings.

Murraya exotica.—This forms a very pretty hedge with pure white sweetly-scented flowers. Propagated from seeds and cuttings.

Myrtus communis.—The Myrtle. Very slow growing but forms a very ornamental hedge. Propagated from seeds and cuttings.

Tecoma stans.—A very quick growing kind and is useful where an immediate effect is required. Suitable for dry positions. Propagated from seeds.

In places where a very fast growing screen is required to temporarily take the place of another hedge of a slow growing nature which is to be the permanent one, the following will prove successful.

Cajanus indicus —The Dhall Propagated from seed

Sesbania agyptica —The Junt

These hedges should be planted about four or five feet away from the permanent hedge, and as soon as the latter has become of a serviceable height, should be dug out

Chapter Twenty-eight.

USEFUL NOTES.

FLORAL DECORATION.

IN all kinds of floral decorations the shade of colour is more important than the size of flowers. When grouping flowers in vases two colours or shades of one colour have a more pleasing appearance than a large number of colours. One tall vase and two smaller ones make a better table centre than three of equal size. Low vases are preferred to tall ones. When arranging a centre vase a good effect is produced by grouping small flowers of a dark shade under larger flowers of a paler colour. Avoid overcrowding. Hand bouquets should be constructed so as to keep fresh as long as possible, in addition to being light to carry, small to grasp, and pleasing to the eye and nose. Buttonholes are most effective when composed of a single flower relieved by its own foliage whenever possible.

COLOUR IN FLOWERS.

In certain families of plants particular colours prevail and in no single instance can we expect to see Blue, Yellow and Scarlet colours in varieties of the same species. Bring any family of plants to mind and it will be seen how undeviating is this law. In the Dahlia we have scarlet and yellow, but no approach to blue, and so in the rose, hollyhock, etc. In the Verbena, Salvia, etc., we have scarlet and blue, but no yellow. In the Hyacinth we have blue and a fairly good yellow, but no scarlet. Of course

in this family we have the combination, crimson, but crimson is not scarlet any more than blue is purple

TOMATOES

These plants can be grafted on the root of the potato and the same plant will produce both crops well

PRICKLES AND SPINES

In ordinary language these terms are often confounded. A prickle is a mere outgrowth from the bark, and a slight pressure at the base will suffice to detach it, as its attachment is only superficial. A spine is an abortive sharp-pointed branchlet. To remove a spine the woody cylinder of the branch with which it is continuous has to be broken or cut.

THORNS AND SPIKES

These have generally been regarded as means of defence against browsing animals. Spines and prickly plants are particularly characteristic of dry places. If a spiny plant is grown in a garden with a very moist soil and the air be kept moist as well round the plant, the seedlings grow up or the cuttings send out shoots with much shorter spines than on the wild plant in Nature. In the second season none are formed at all. Spinescence is nothing more than the inevitable result of living under such conditions as tend to arrest the softer cellular tissues and to harden the woody ones, so that the ribs and veins of leaves grow out into spiny terminations or the whole leaf may be reduced to a needle-like structure, and branches instead of elongating into leafy shoots remain short and pointed. As to their being defensive, this must only be a secondary and accidental result.

USE OF HAIRS ON PLANTS

Plants habitually growing in dry places are much more hairy than those in commonly wet and damp places. The

same kind of plant is more hardy in the former than in the latter, and the presence or absence of hairs is an adaption to the localities in question.

In hot deserts nearly all the plants in the dry water courses are of a grey colour and not bright green, due to the thick coating of hair which prevents the green colouring matter to be seen. An analogous change occurs when wild hairy plants are cultivated in a garden; the Parsnip, densely clothed with hairs when wild, is quite hairless when cultivated. The use of hairs are many, and in the desert they take on various forms. They may be stiff and pressed to the surface, all lying in one direction, or they are interlaced, or they may be of a twisted cottony character and cover the surface with a layer of wool, or they may be stellate and flat branches interlacing so as to produce a thick coating of felt. They may be bladdery and filled with water, but they finally collapse and form a glossy sheet over the surface of the leaf. Being more or less non-conducting they protect plants from excessive heat and light and so tend to reduce transpiration, or loss of water from the interior of the plant. Besides the desert many alpine plants are densely coated with hair. Their use in high mountains is presumably in checking the great cold. The next use is as an absorbent. In many desert plants the hairs are often coated with wax, but it is slashed so as to leave spaces through which the dew—and dew is very heavy for the greater part of the year—can be absorbed and the plants nourished by water. If the foliage is at all flacid from an excess of transpiration over the absorption by the root then the leaves will absorb water with rapidity.

DRAINAGE.

Drainage removes stagnant water and raises the temperature of the soil by admitting warm air. It makes the soil more productive and brings an earlier harvest. It improves the working qualities of the soil and helps

manures to act more readily. It sweetens sour land and encourages heavy crops of good quality. It reduces the number of noxious insects in the garden and discourages the growth of obnoxious weeds.

SUCKERS

Suckers occur where there is a check of sap and an excess of air to the soil. Bury a shoot and it makes roots, expose a root and it makes shoots. The roots of some trees cannot form wood buds near the surface, others can make buds which provide growth in the form of suckers. In all cases suckers arise in response to the influence of air, light and sun heat. They spring almost entirely from the top sides of roots and only occur within the free and aerated depths. Only horizontal roots yield them, and where a root rises and falls, the highest points alone develop wood buds and send up shoots. Old trees sucker most, because their roots have so filled the soil as to force many near the surface. Shallow, extra stiff, cold and wet soils may induce suckering. Careless digging also promotes suckers by allowing too much air to the roots and by causing wounds whence bud forming sap accumulates to produce suckers. Where the soil is frequently made up and the surface kept free of heavy roots, suckers are not likely to prove a nuisance. The harm done by suckers is in proportion to the leaves they make.

AN INCH OF RAIN

An acre is equal to 6,272,640 square inches. An inch deep of water on this acre will be as many cubic inches of water, which at 231 to the gallon, is 27,154 gallons. This immense quantity of water will weigh 228,190 lbs or 114 tons, or 4½ gallons to the square yard.

DESTRUCTION OF TREES BY POISON

In order to destroy trees quickly the use of arsenic and soda is recommended. The solution must be applied when

the tree is dormant and should be poured into a frill ring cut in the bark of the tree down to the wood. For trees four feet in diameter about a quart of solution is required. One pound of arsenic, three pounds of washing soda and four gallons of water is necessary. Mix the arsenic to a paste and pour it slowly into the soda solution, stirring all the time. Boil if necessary in order to obtain a clear solution and avoid inhaling the fumes, which are poisonous.

AN ACRE.

60 feet by 726 feet.

110 " " 396 "

129 " " 363 "

220 " " 198 "

240 " " 181 "

440 " " 99 "

5 yards by 968 yards.

10 " " 485 "

20 " " 242 "

70 " " $69\frac{1}{2}$ "

80 " " $60\frac{1}{2}$ "

209 feet square nearly.

CAPACITY OF A TANK.

A circular tank—

1 ft. in depth and 5 feet in diameter holds 142 gallons.

Do. 6 " " " 215 "

Do. 7 " " " $283\frac{1}{2}$ "

Do. 8 " " " 378 "

Do. 9 " " " $472\frac{1}{2}$ "

Do. 10 " " " $582\frac{3}{4}$ "

MEASURING TIMBER

To measure square timber multiply the length, width and thickness together and divide the result by 12

PLOUGHING

Width of furrow—

7 ins	in ploughing one acre travels	14½ miles
8 "	" "	12½
9 "	" "	11
10 "	" "	9½ "
11 "	" "	9 "
12 "	" "	8½ "
13 "	" "	7½ "
14 "	" "	7
15 "	" "	6½ "
16 "	" "	6½ "

NUMBER OF TREES TO AN ACRE

4 feet apart 2,720 trees

5 "	" "	1,749 "
6 "	" "	1,200 "
8 "	" "	689 "
10 "	" "	430 "
12 "	" "	325 "
15 "	" "	200 "
18 "	" "	135 "
20 "	" "	110 "
22 "	" "	70 "
30 "	" "	50 "

WATER RAISED BY A PUMP.

Take the diameter of the pump cylinder and the length of the stroke. Square the diameter of the cylinder, multiply this by the length of the stroke and divide by 353. The result will be the number of gallons raised by each stroke of the piston rod.

STAFF ESTIMATE.

For an ornamental irrigated area one man is sufficient to look after three acres, and for a non-irrigated area one man is sufficient to look after ten acres. For nursery ground half an acre per man.

WATER SUPPLY.

The minimum supply for good work during the months of March, April, May and June is 6,000 gallons per day per acre; during September, October and November 3,000 gallons, and during December, January and February 1,500 gallons. Knowing the acreage and the capacity of the pumping plant, it is easy to arrive at the number of hours pumping is required during each period.

BULLOCK POWER.

What number of bullocks will be required to water a garden of 50 acres daily? It takes 35,100 gallons of water to irrigate one acre; it will take 1,755,000 gallons to irrigate 50 acres. One pair of bullocks draw 15,000 gallons of water daily, hence 117 pairs will be required, or approximately two pairs per acre.

SEASONS

Winter in the vernacular is known as Rabi

Summer in the vernacular is known as Kharif

MONTHS

January in the vernacular is known as			Magh
February	do	do	Phagoon
March	do	do	Chait
April	do	do	Baisakh
May	do	do	Jait
June	do	do	Asir
July	do	do	Sawan
August	do	do	Bhadon
September	do	do	Kowar
October	do	do	Katik
November	do	do	Aghan
December	do	do	Poos

COMPARISON OF THERMOMETERS

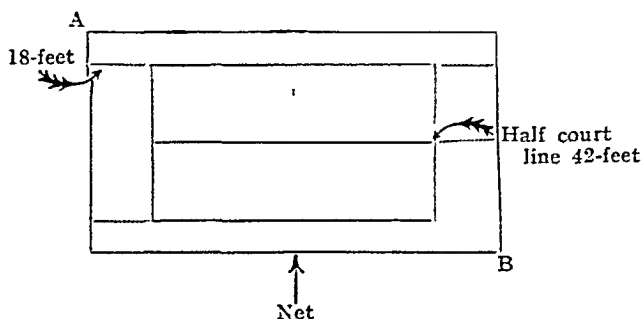
Thermometer	Freezing point	Boiling point	Equivalents compared with Fahrenheit thermometer					
Fahrenheit	32	212	0	20	30	40	50	60
Centigrade	0	100	-17½	-6½	-1	4½	10	15½
Reaumur	0	80	-14	-5	-1	3½	8	12½

TENNIS LAWN.

A full sized court is 78 feet by 36 feet.

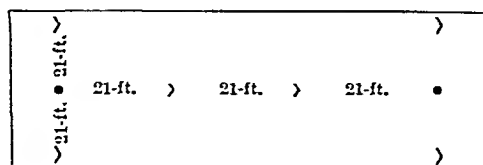
A "singles" court is 78 feet by 27 feet.

The diagonal distance from A to B is 85 feet 11 inches; this figure is helpful when setting out the court, and ensures it being square.



CROQUET LAWN.

Full size 105 feet by 84 feet. For smaller grounds any multiple of 5 by 4 may be taken. There are six hoops and two pegs. Each hoop must have a clear freeway of 12 inches by 4 inches and no more. Pegs two feet out of the ground.



CRICKET.

Length of pitch is 22 yards. Popping crease four feet from the wicket and the bowling crease eight feet eight inches long.

MANURES

When mixing artificial manures care must be taken not to mix those which would set up a chemical reaction unfavourable to their object. For example, Nitrate of Soda must not be mixed with Superphosphate, otherwise nitric acid will be set free and will escape as fumes and the nitrogen be lost. Similarly Basic Slag must not be mixed with Sulphate of Ammonia or the ammonia will be lost. The following should not be mixed —

Nitrate of Soda and farmyard manure

Lime and farmyard manure

Basic Slag and farmyard manure

Lime and Sulphate of Ammonia

Basic Slag and Sulphate of Ammonia

Lime and Nitrate of Lime

SUBSTITUTE FOR FARMYARD MANURE

May be made in from six to eight months by forming a stack of garden refuse. All garden refuse that will decay may be used so long as it is not diseased and each nine inch layer should receive a slight sprinkling of sulphate of ammonia.

WOOD ASH

This is a most valuable potash manure and cannot be too highly prized. All cuttings and trimmings which are not required for leaf mould should be burnt at frequent intervals as they are available. The ash should be collected and stored away under cover from rain.

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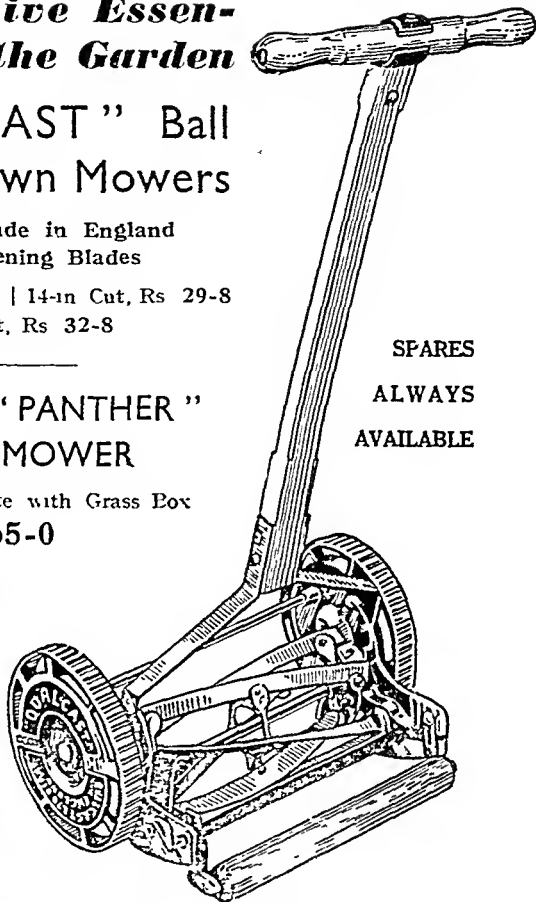
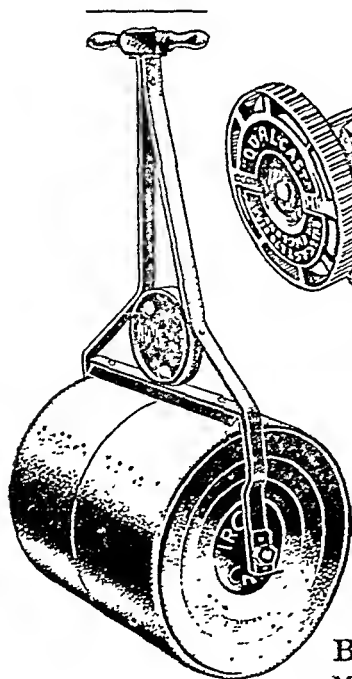
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